

STEPHENS ELECTRONICS, INC

technical manual

811-D

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PROFESSIONAL AUDIO
RECORDER/REPRODUCERS

811-D

STEPHENS ELECTRONICS, INC.

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This button sets the machine for play mode, moving the tape at the selected speed. The button lights when in play or record mode, and it must also be pressed simultaneously with the Record button to initiate Record Mode.



This button sets the machine for record mode, provided the PLAY button is simultaneously pressed. The button lights when recording.

In order for individual tracks to actually record, the corresponding Mode Selector must be switched to one of the three Record **READY** positions. Refer to section 1.1.2 for details of the Mode Selector function.



This button stops the machine from any mode.

CAUTION: When the end of the tape runs off a reel, the **LOAD** button must be pressed. Pressing **STOP** under these circumstances will not stop the reel motors.



Shuts off all reel motors and drops the tape lifters when the button is pressed. Button is lit when in load mode. **LOAD** allows manually controlled tape motion by defeating the constant tension servo mechanism responsible for automatic slack takeup. It is useful for threading

tape and for editing. The machine will leave load mode when **STOP** or any motion button is subsequently depressed.

LOAD may be pressed simultaneously with another motion control. For example, pressing **PLAY** and **LOAD** permits precise cueing (play/load mode), and pressing **PLAY**, **RECORD** and **LOAD** permits spot-erasure (record/load mode).

NOTE: When spot erasure is complete, press the **REWIND** or **FORWARD** button to drop out of record without "clicks."

LOAD may be used when tape is not threaded but it is necessary to use the motion controls for alignment or check-out. Some motion may begin, but slight hand pressure on the reels will hold the tape stationary. A specific application of this function is to find out whether or not the machine is in **PRE** when switched to play mode; the desired **PRE** status may be selected without actually advancing the tape.

CAUTION: NEVER DEPRESS LOAD WITH A REEL OF TAPE THREADED AND MOVING. This removes the tape tension, and can cause uncontrolled spillage. **LOAD** should only be pressed when the reels are still, or when approaching 15' from the end of the tape.

1.1.2 SYNC PANEL Ready and Record indicators, a VU meter and a Mode Selector switch are mounted on the Sync Panel, one set per channel. The actual functions performed by these indicators and switches are somewhat complex, and are treated in greater detail elsewhere in section one. Below are listed brief descriptions of each item on the front of the Sync Panel.

| ITEM | DESCRIPTION |
|-------------------------------------|--|
| VU METER | This reads the average signal level of the channel, either from the line input or the play amplifier output: the play amplifier derives its signal from either the record or the play head, depending upon the logic and switch functions (described elsewhere in section one). The meter is factory calibrated for 0 VU=+4 dBm (into 600 ohms). |
| READY Indicator (amber lens) | This lamp lights when the channel's Mode Selector switch is in any of the three Record positions, but the transport is not in record mode. The light is a signal that the channel will record as soon as the machine is placed in record mode. |

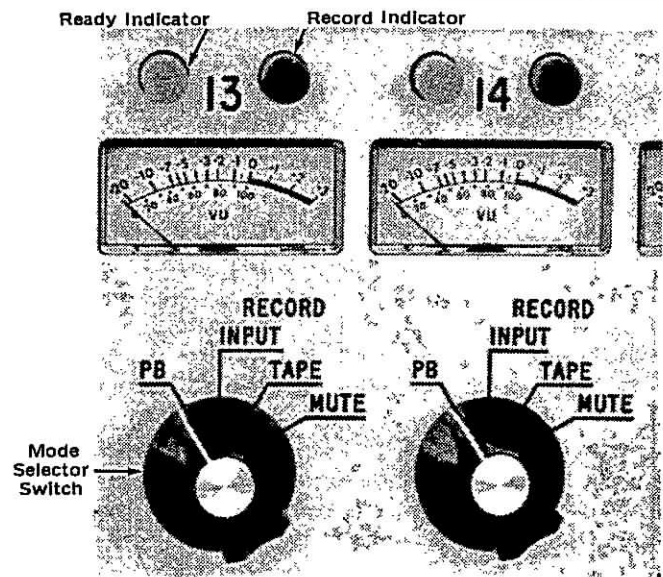
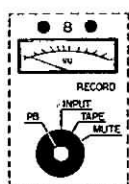


Figure 1-2. Sync Panel Controls & Indicators

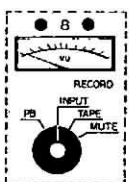
| | |
|------------------------------------|--|
| RECORD Indicator (red lens) | This lamp lights when the channel's Mode Selector switch is in any of the three Record positions and the transport is in record mode. The light is a warning that the channel is actually recording. |
|------------------------------------|--|

MODE SELECTOR

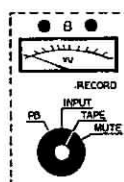
This switch determines the status of the record and playback electronics for the corresponding channel. There are four modes:



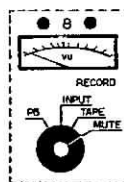
PB (Playback) This is the *SAFE* position from which the track cannot be erased or recorded. The channel output is derived from either the play or the record head, depending upon the sync status. The VU meter follows the channel output, whether derived from the record or play head.



RECORD/INPUT This is a *READY* mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is derived from the line input whenever PRE is lit, and from the play amplifier when PRE is off: the play amplifier signal is derived from the play head or record head, depending upon the sync status.



RECORD/TAPE This is a *READY* mode from which the track may be recorded. The VU meter and the channel output both follow the play amplifier output. The play amplifier output will always be from the play head unless the machine is in play/sync mode; then the output will be derived from the record head.



RECORD/MUTE This is a *READY* mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is muted (no output) whenever PRE is lit. Therefore, the only time when there is channel output is in play mode with PRE off. This output will be derived from the record head, or the play head, depending on the SYNC status.

1.2 PRE-OPERATING PROCEDURE

1.2.1 APPLY POWER Press the **POWER** button. This illuminates both the button and the VU meters, and prepares the machine for operation.



Selecting Scan speed (button lit) will advance the tape at 60ips in play or record modes. The equalization is not affected by the SCAN button.

1.2.2 SELECT TAPE SPEED The tape speed is determined in three ways. Each speed selector described below will override the previous one.



Select the desired play or record speed with this button. The speed is 30ips when the button is lit, and 15ips unlit. Electronic record/play equalization is automatically switched to conform to the selected tape speed.

The variable speed oscillator has a Locked/Variable speed switch. This switch does not affect the equalization. In Locked position (toggle switch up), the transport will play or record at the previously selected 15ips, 30ips or Scan speed. In Variable position (toggle switch down), the vernier dial may be adjusted to continuously vary the tape speed, to deviate $\pm 33\%$ from the selected speed.

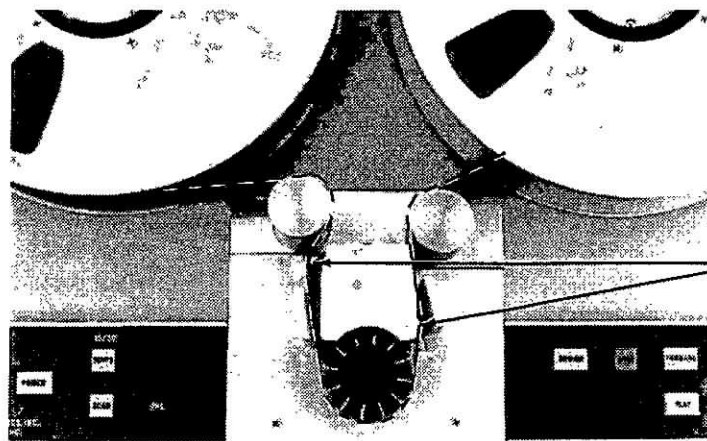


Figure 1-3.
Tape Threading Path

NOTE: Tape is routed outside lifters.

1.2.3 THREAD TAPE Only reels with NAB hubs, $4\frac{1}{2}$ " diameter (11.4cm) may be used. The supply and takeup reel sizes may be mixed since the transport servo mechanism automatically adjusts the motors to obtain the proper tape tension.

To facilitate threading, apply power and press the **LOAD**

button. This eliminates the braking force and also prevents runaway motion of the reels. Thread the tape as illustrated in figure 1-3, anchoring the end to the hub of the takeup reel. Hand-turn the takeup reel to remove most of the slack, and press the **STOP** button; **STOP** removes the machine from load mode and fully tensions the tape.

1.3 PLAYBACK

- Step 1** Set the Mode Selector of each channel to PB.
- Step 2** Apply power, select the desired speed, and thread the tape as described in section 1.2. Amber *READY* lights should not be lit.

Step 3 Press the PLAY button to initiate playback. The channel outputs and VU levels will be derived from the play head. The audio quality from SYNC is the same as normal play mode.

Step 4 Press the STOP button to end playback and stop tape motion.

NOTE: *If tape runs completely off the reel, press LOAD. Do not press STOP.*

1.4 FAST WINDING

1.4.1 FORWARD WINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the FORWARD button to initiate fast winding onto the takeup reel. This may be initiated from any mode.
- Step 3** Press the STOP button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the LOAD button.

1.4.2 REWINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the REWIND button to initiate fast winding onto the supply reel. This may be initiated from any mode.
- Step 3** Press the STOP button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the LOAD button.

1.5 RECORDING

NOTE: *Always bulk-erase any tape which was recorded on equipment with a different head configuration. This assures complete erasure.*

1.5.1 WITHOUT SYNC

- Step 1** Tape should be threaded with power ON, as described in section 1.2.
- Step 2** Set the Mode Selector switch for each channel. Channels to be recorded should be set to RECORD/INPUT, and the *READY* light will turn on. Channels not to be recorded should be set to PB.
- Step 3** Apply a test signal or sample program material to the input of all channels to be recorded. Adjust the input levels so that the corresponding VU meters indicate no more than 0 VU for most peaks.* Extreme peaks may indicate +2 or +3.
- Step 4** When ready to record, press the PLAY button and hold it down while pressing the RECORD button. All channels that were in *READY* will now record; the amber lights will turn off and the red lights will turn on.

NOTE: *The VU readings and audio output of the channel(s) recording are now derived from the line input. For*

monitoring the actual recorded signal, set the Mode Selector(s) to Record/Tape; the VU reading(s) and channel output(s) will now be derived from the play head.

- Step 5** Press the STOP button to end recording and stop the tape motion, unless the tape has run completely off the supply reel; in that case, press LOAD.

1.5.2 WITH SYNC The Sync feature allows recordings to be made in synchronization with previously recorded program material. In order to achieve the correct timing, all channel outputs are derived from the record head while the machine is in PLAY/SYNC mode. As soon as the RECORD button is pressed, placing the machine in RECORD/SYNC mode, the input to channels in RECORD replaces the record head output. For channels in PB, the record head output continues to feed the channel output, so that a performer or engineer may monitor the new recording in synchronization with the existing tracks.

- Step 1** With power ON, thread tape on the transport, as described in section 1.2.
- Step 2** Set the Mode Selector for each channel; channels to be recorded should be set to RECORD/INPUT. Previously recorded or unused channels should be protected by setting the Mode Selector to PB.

* 0 VU is factory calibrated to a level of +4 dBm.

- | | |
|--|--|
| <p>Step 3 Depress the SYNC button. It should light, indicating the machine is ready to play and record in sync.</p> <p>Step 4 Apply a test signal or sample program material to the input of those channels to be recorded. Adjust the input levels so that the corresponding VU meters show peaks of no more than 0 VU. Extreme peaks may indicate +2 or +3 VU.</p> <p>NOTE: <i>During synchronized recording, some performers prefer to have their channel(s) muted. If the Mode Selector is placed in RECORD/MUTE, then the desired effect will be achieved; the channel will have no audio output while recording. The output during PLAY will be muted if PRE is lit, or will be derived from the record head if PRE is off.</i></p> | <p>Step 5 Press the PLAY button. The output of all previously recorded channels may now be monitored, and at the instant recording is to begin, the PLAY and RECORD buttons may be depressed.</p> <p>Step 6 By switching the Mode Selectors to RECORD/TAPE, the quality of the recorded signal may be monitored. This mode of monitoring is generally preferred, so long as the output from the channels is not fed to the performer; since there is a time delay, such monitoring could be disconcerting.</p> <p>Step 7 Press the STOP button to end recording and halt the tape motion, unless the tape has run completely off the supply reel. In that case, press LOAD.</p> |
|--|--|

1.6 EDITING

The two edit modes available are PLAY/LOAD and PLAY/SCAN. The PLAY/LOAD mode should be entered only from STOP mode. It is used to precisely locate cues. IN PLAY/LOAD, the reel motors do not maintain tape tension, so the tape may be manually controlled. This also makes splicing easy, since slack is not automatically taken up. To leave PLAY/LOAD mode, press STOP or any other motion button.

PLAY/SCAN is helpful for rough location of program cues. Pressing the SCAN button sets the transport for a 60ips speed, although equalization remains at the 15ips or 30ips setting previously selected. When PLAY is then pressed, the machine will play at 60ips. SCAN may be punched in and out during the playback of a tape. To leave SCAN mode, press the SCAN button a second time.

NOTE: *RECORD/SCAN mode may be used, and recording will occur at the rate of 60ips. But equalization remains optimized for 15ips or 30ips. RECORD/LOAD mode may be used to achieve spot erasures, but care must be taken to assure that the erase head, not the record head, is aligned with the point where erasure is to begin. Press REWIND or FORWARD when erasure is complete to eliminate punch-out "clicks."*

SECTION TWO
ELECTRONIC ALIGNMENT AND
TAPE HANDLING ADJUSTMENT

2.1 ELECTRONIC ALIGNMENT

The record and playback electronics are aligned in a manner similar to other professional tape machines. The equalization curves fall within NAB specifications, although there is some deviation from the idealized NAB curve which enables Stephens' machines to record low frequencies at greater levels before reaching tape saturation. Nevertheless, standard NAB alignment tapes are used in the following procedures.

Stephens' heads are factory calibrated to the proper azimuth, zenith and meridian. Because the heads and transport top plates are precision machined, no further mechanical alignment is necessary.

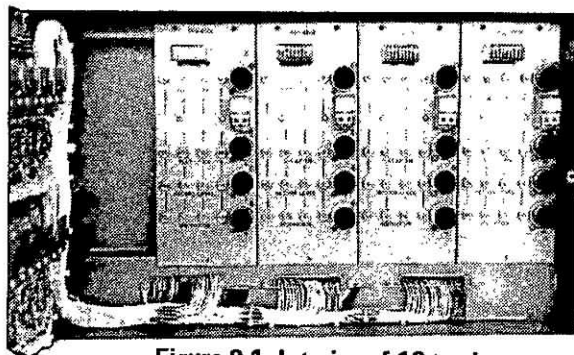


Figure 2-1. Interior of 16-track Sync Panel showing 811D-4000 Modules

2.1.1 PLAY LEVEL & EQUALIZATION

Step 1 Degauss the heads in accordance with standard procedures. This is a conventional method for removing any residual magnetism from the heads, magnetism which may otherwise degrade the high frequencies on delicate alignment tapes, interfering with proper level calibration.

Step 2 Turn power ON and press LOAD. Thread a standard NAB alignment tape for the appropriate speed on the transport. A Full-Track alignment tape is preferable.

NOTE: It is generally desirable to store alignment tapes with the tail end out. Therefore, the tape will be threaded from the right to the left, and rewound. This procedure assures evenly wound tape.

Step 3 Set the transport speed to correspond with the alignment tape, 15ips or 30ips.

Step 4 Set all sync panel Model Selectors to PB.

Step 5 Undo the latch on the sync panel, and swing the panel open, revealing the 811D-4300 series modules. Refer to figure 2-1.

Figure 2-2. 811D-4000 Module

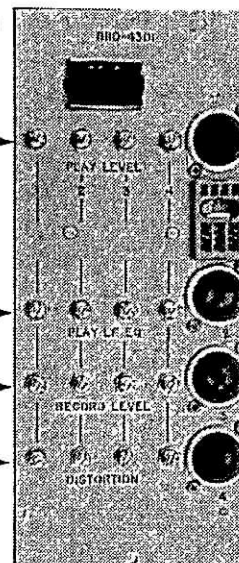
Play Level Trim
(Section 2.1.1)

Play LF EQ Trim
(Section 2.1.3)

Record Level Trim
(Section 2.1.1)

Distortion Trim

These controls, not provided on all models, are factory adjusted and should not be disturbed.



Step 6 Press the PLAY button, and locate a 0 VU reference on the tape, preferably at 1000Hz.

Step 7 Adjust the PLAY LEVEL of each channel (the trimmer on the top row of the 4300 module) so the corresponding VU meter indicates 0 dB. Refer to figure 2-2.

Step 8 Press the STOP button.

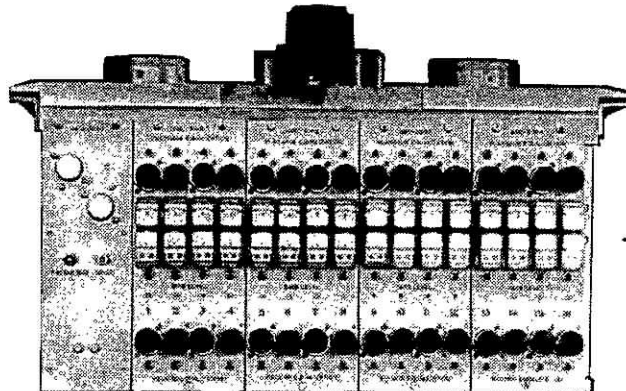
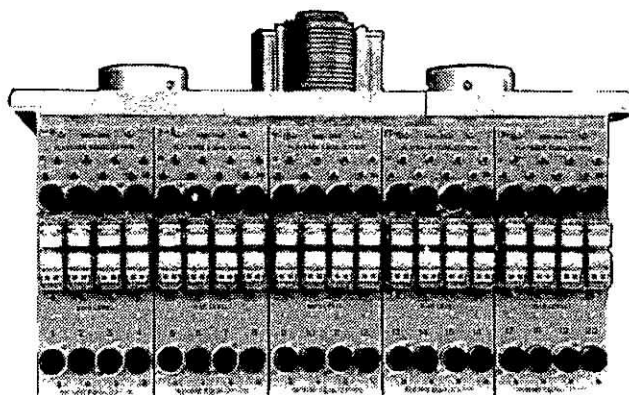


Figure 2-3. Front of Model 103 Transport 16-track (above) and 24-track (below)



- Step 9** Locate the 811D-3000 series modules at the front edge of the transport; cabinets have a door which swings down for access to these modules when the pair of buttons at the upper corners are depressed.

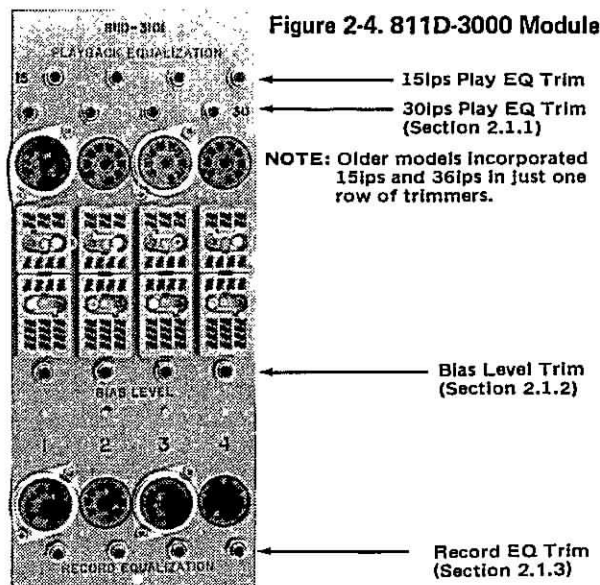


Figure 2-4. 811D-3000 Module

- Step 10** Place the machine in PLAY mode, and locate the 0 VU, 15 kHz reference on the tape.
- Step 11** Adjust each channel's PLAYBACK EQUALIZATION (trimmers located on the 811D-3000 series modules), so the corresponding VU meter indicates 0 dB. (Refer to fig. 2-4.)

NOTE: Adjust the trimmers corresponding to the tape speed; top row for 15ips and lower row for 30ips. Early models are equipped with just one set of trimmers, used for either play speed.

- Step 12** Press FORWARD, and wind the alignment tape to the end; then press LOAD and remove the tape from the transport.

This completes the playback alignment. All controls may be left as they are, with the 811D-3000 modules exposed, in preparation for the following procedures.

2.1.2 BIAS LEVEL & RECORD LEVEL The front of the transport should be exposed, as described in 2.1.1, step 9. Power is ON.

- Step 1** Thread a blank tape on the transport (section 1.2.3).
- Step 2** Set all Mode Selectors to RECORD/TAPE.
- NOTE:** The procedures outlined in steps 3-7 are to be performed for each channel in succession.
- Step 3** Apply a 1000 Hz, +4 dBm sine wave to input.
- Step 4** Adjust the RECORD LEVEL trimmer (in the sync panel, see figure 2-2) to approximately mid rotation.

- Step 5** Press PLAY and RECORD, placing the machine in record mode.
- Step 6** Set the BIAS LEVEL trimmer (on the 811D-3000 module, see figure 2-4) by turning it clockwise until the corresponding VU meter reaches a peak, then continue to turn clockwise until the level drops 1/4 to 1/8 dB below the peak.
- Step 7** Readjust the RECORD LEVEL trimmer so that the VU meter indicates 0 dB.
- Step 8** Press STOP. This completes the record and bias level adjustments.

2.1.3 BIAS FREQUENCY & SYMMETRY

Trimmers for bias frequency and symmetry are located on the bias module, and are set at the factory for optimum performance. While the bias frequency does not affect the quality of the recorded signal, it does affect the efficiency of conversion of the electrical signal to the magnetic flux. The frequency is therefore factory set for maximum efficiency with the largest number of tracks in RECORD mode. The symmetry control, labeled NOISE, affects the waveform of the bias, and consequently the noise level of the unmodulated, recorded tape. The noise setting is not critical; however, if the optimum noise characteristic is desired, bias symmetry may be adjusted as follows:

- Step 1** The transport should be oriented so that the bias module is accessible. On machines of up to 16 tracks, the bias module is mounted on the front of the transport. 24 track or larger machines may have twin bias modules beneath the transport; one module is slaved to the other, so only one set of frequency & symmetry trimmers is provided.
- Step 2** Thread a blank tape on the transport (section 1.2.3), with power ON.

- Step 3** To arrive at the optimum symmetry setting, first determine the number of tracks which are simultaneously placed in RECORD MODE. For example, a 24 track machine may be operated with just 8 tracks in record mode at any given time. Set this number of tracks in RECORD/TAPE position with the sync panel mode selector. The resulting load on the bias circuit is slight but it will enable the most accurate setting of the symmetry (noise) control.

- Step 4** Monitor the output of any one of those tracks placed in RECORD; then place the transport in RECORD MODE by pressing the PLAY and RECORD buttons simultaneously.

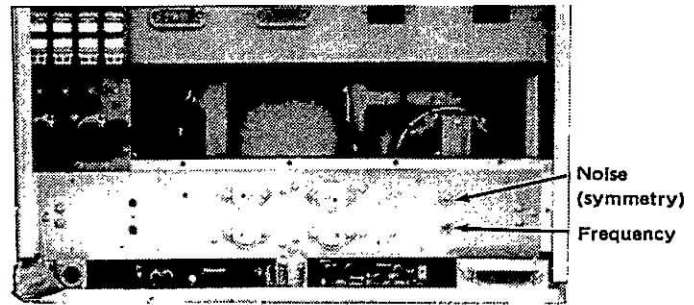


Figure 2-5. Bias Modules Beneath 24/40 Track Transport

- Step 5** Adjust the NOISE trimmer for the minimum noise on the track being monitored (monitoring can be done with a voltmeter or by ear).
- Step 6** Press STOP. This completes the symmetry adjustment.

2.1.4 RECORD EQ The 811D-3000 modules should be accessible, as described in section 2.1.1, step 9. A test oscillator should be available for connection to the input of each channel (or by means of input assignment through the mixing console).

- Step 1** Turn the power ON, and thread a blank tape on the transport.
- Step 2** Set all sync panel Mode Selectors to RECORD/TAPE.
- Step 3** Press the PLAY and RECORD buttons, placing the machine in record mode.
- NOTE: The procedures outlined in steps 4-7 are to be performed for each channel in succession.*
- Step 4** Apply a 15 kHz, +4 dBm sine wave to the input.
- Step 5** Adjust the RECORD EQUALIZATION (trimmer located on the 811D-

3000 module, see figure 2-4) so the corresponding VU meter indicates 0 dB.

NOTE: Steps 6 and 7 are required only for 15ips alignment. For 30ips alignment, proceed with step 8.

- Step 6** Change the input signal to a +4 dBm sine wave of between 35 and 40 Hz.
- Step 7** Adjust the PLAY LF EQ (trimmer in the sync panel, see figure 2-2) so the corresponding VU meter indicates 0 dB.
- Step 8** Press REWIND and when the tape runs off the takeup reel, press LOAD. This completes the recording equalization adjustments.
- NOTE: It is considered a safe practice to reset all Mode Selectors to PB, unless recording is to be done immediately following the alignment procedure.*

2.2 TAPE MOTION ADJUSTMENTS

The Stephens' transport is designed for gentle tape handling without need for mechanical adjustments. The servo-operated supply and takeup motors are controlled by circuitry which compares the actual tape motion with the desired motion. This is done by means of a tachometer and a discrimination circuit which integrates the measured tape speed with motion sensing inputs from each motor and with a synchronization signal from an internal clock or an external oscillator/resolver. Therefore, the only adjustments required are electrical in nature.

2.2.1 TAPE TENSION ADJUSTMENT

The following adjustment requires a voltmeter capable of accurately indicating 10 volts dc. The bottom of the transport must be accessible (see section 2.1.1, step 9).

- Step 1** Connect a voltmeter across the 5-ohm resistor on the power supply. The meter should be set to the 10 Vdc scale (or higher), with the leads connected as shown in figure 2-6.
- Step 2** Apply power to the transport and thread a reel of tape.
- Step 3** Press the PLAY button, placing the transport in motion at 15ips or 30ips.
- Step 4** Locate the tension trimmer on the SERVO CONTROL BOARD beneath the transport and adjust it for a reading of 10 volts across the power resistor (for 2" tape. 1" tape requires 7 volts). See figure 2-7.

- Step 5** Press the STOP button, and disconnect the voltmeter leads from the power resistor. This completes the tension adjustment.

Connect Voltmeter across
this resistor
Twisted lead (+)
Gray lead (-)

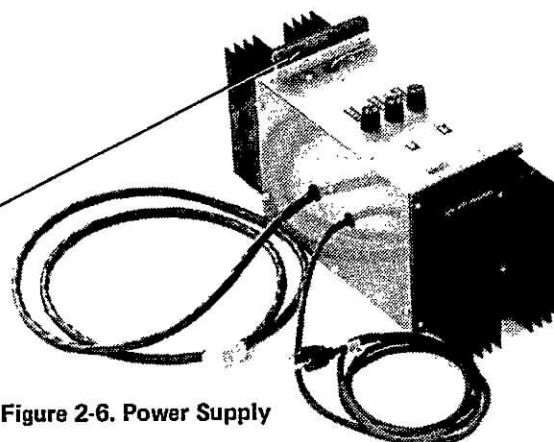


Figure 2-6. Power Supply

2.2.2 SLACK ADJUSTMENT The bottom of the transport must be accessible (see section 1.1.1, step 9).

- Step 1** With no tape threaded on the transport, turn the power ON and press the STOP button.
- Step 2** Locate the SLACK control on the SERVO CONTROL BOARD (refer to figure 2-7).
- Step 3** Adjust the SLACK trimmer in a clockwise direction until the supply motor does not move.
- Step 4** Then rotate the trimmer counterclockwise until the motor just begins to move; it may alternately start and stop. This is the correct setting for the SLACK trimmer.
- Step 5** Turn off the power. The adjustment is complete.

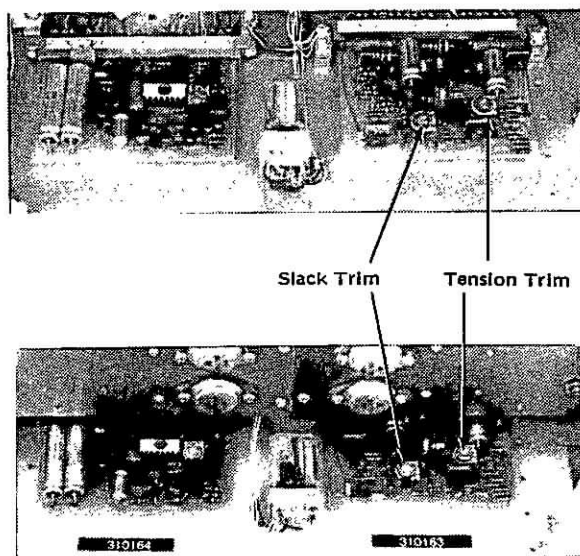


Figure 2-7. Servo and Resolver Boards
4 – 16-track (above) and 24 – 40-track (below)

2.2.3 SPEED ADJUSTMENT The fixed running speed of the transport may be precisely calibrated to 15ips, 30ips and 60ips by means of three independent trimmers. These trimmers are adjusted using the meter in the remote VS0 unit. Three tachometer-triggered counter outputs in the transport provide approximately 60 Hz pulses for 15ips, 30ips and 60ips running speeds. When a given tape speed is precisely adjusted, the counter output will be exactly 60 Hz, corresponding to the sync signal. The sync signal is derived from the power mains or from an optional crystal/resolver input. At exact speed, the VS0 meter will settle at mid-scale, rather than follow the beat of the out-of-phase signals.

The following adjustment may be done for one, two or all three tape speeds; speed trimmers for 15, 30 and 60ips are recessed beneath a cover plate, near the power button.

- Step 1** Turn the power ON, and thread a reel of tape.
- Step 2** Place the transport in PLAY mode, with the desired speed selected (i.e. 15ips, 30ips or SCAN).

- Step 3** Observe the VS0 meter, with the VS0 switched to fixed speed mode.

NOTE: The VS0 meter should stabilize near mid-scale as the tape reaches full running speed. If there is a large rhythmic motion of the needle, then the speed must be adjusted. If the meter has a slight motion, but is near mid-scale, then adjustment is not necessary.

- Step 4** Remove the cover plate surrounding the POWER, PRE SCAN, SYNC and 30ips buttons. This may be done by inserting a screwdriver blade between the cabinet and the transport and prying up the cover.
- Step 5** Insert a screwdriver in the trimmer which corresponds to the speed selected. Adjust the trimmer gradually until the meter needle comes to rest at

mid-scale (see fig. 2-8). Due to temperature sensitivity, some upscale drift occurs if this adjustment is made when the machine has just been turned on. Therefore, it may be desirable to set the meter for a reading below mid-scale, allowing for the drift. Since the important factor is the stabilization of the needle, rather than the actual value on the scale, any stable setting from 0.3 to 0.7 is acceptable. The meter indicates phase lock rather than actual speed.

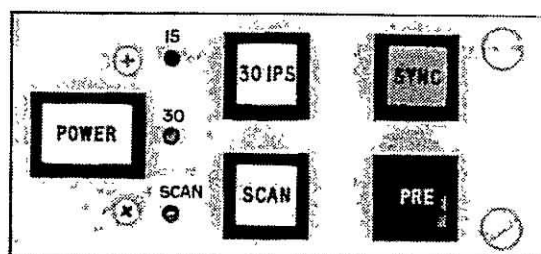


Figure 2-8. Speed Trimmers

- Step 6** Press STOP. If other speed calibration is required, repeat steps 2, 3 and 5 before replacing the cover plate.
- Step 7** Turn the power OFF and replace the cover plate.

Stephens Sync panel input-output (I/O) cable ribbon connector information:

(Amphenol 57-40500 chasis)
(Amphenol 57-30500 cable)

Note: 24 track and 16 track I/O connectors not interchangeable

connector 1 (SJ-15)

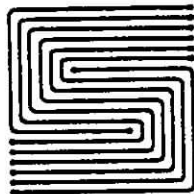
| Pin | connection |
|-------|---------------------------------|
| 1-12 | Playback out 1 is channel 1 out |
| 13-24 | Record in 13 is channel 1 in |
| 25-37 | Dolby (26 is channel 1) |
| 38 | Record |
| 39-50 | Grounds |

connector 2 SJ-16 (same as above except as noted below:

| Pin | Connection |
|-----|--------------------------------------|
| 38 | (function not designated by factory) |

16 track machine connections:

| Pin | connection |
|-------|-----------------------------|
| 10-25 | grounds (buss together) |
| 26-33 | Dolby |
| 34 | Record |
| 35-42 | 1-8 or 9-16 record input |
| 43-50 | 1-8 or 9-16 playback output |



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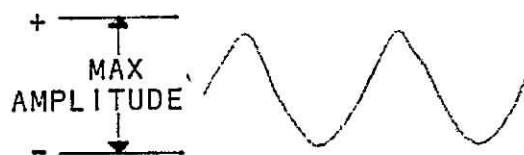
PHONE: (213) 842-5116

SENSOR ALIGNMENT

For the following procedure, the operator should be knowledgeable about the use of an oscilloscope. Be sure to ground the scope to the chassis of the machine before starting the alignment procedure.

1. Remove head shield carriers to get access to sensors.
2. Center SYM and 90 SYM pots.
3. Connect scope to TP 6, and set for .02 volts/div., Internal positive trigger.
4. Rotate BAL pot fully clockwise. With tape loaded, and deck in play mode, adjust Sensor 2 for maximum amplitude with minimum amplitude variation.

WARNING: Use extreme caution when adjusting sensors not to hit the encoded disk. Hitting the disk with a screwdriver or the inner surface of the sensor can cause permanent damage to the disk.



5. Rotate BAL pot fully counter clockwise. With the same above conditions, adjust Sensor 1 for maximum amplitude with minimum amplitude variation.

When completed, both sensor assemblies should be pointing toward the center of the drum shaft.

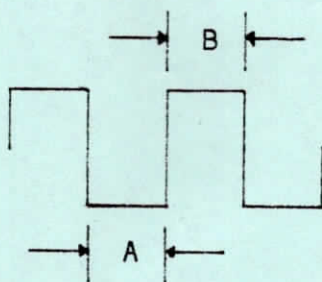
6. Center BAL pot. Rotate Sensor 1 and BAL pot for minimum amplitude on scope. Increase gain of scope for accuracy if necessary. Deck may run wild.

Do not readjust BAL pot for the rest of the alignment procedures.

7. Rotate Sensor 1 slightly for maximum amplitude with minimum amplitude variations.

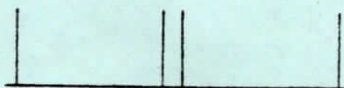
This completes alignment of Sensors 1, 2 and the BAL pot.

8. Connect scope to TP 7. With deck in play mode adjust scope for display of square wave. Adjust SYM pot for symmetry of the square wave.



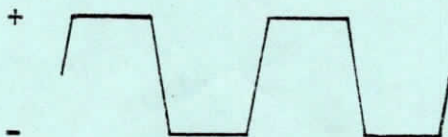
$$A=B$$

9. Connect scope to TP 5. Adjust scope for positive trigger. Reduce gain and adjust sweep for a display of four pulses. The first pulse should be at the start of the trace. Pulses two and three should be closely spaced together at the center of the screen with the fourth pulse at the far right side.



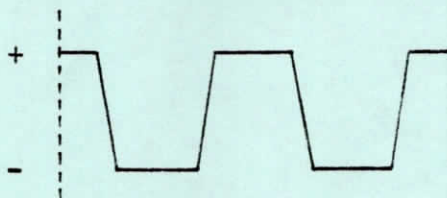
Adjust SYM pot so that pulse two is aligned on top of pulse three. This completes alignment of the SYM pot.

10. Connect scope to TP 1. With deck in play mode, adjust scope to display waveform. Adjust Sensor 3 for maximum amplitude with minimum amplitude variation. Adjust 90 SYM pot for symmetry of waveform.



11. Connect external trigger of scope to TP 2. With deck in play mode, switch scope to external positive trigger. Adjust trigger for a stable pattern.

12. Rotate Sensor 3 so that the scope trace starts with half of the positive portion of the square wave.

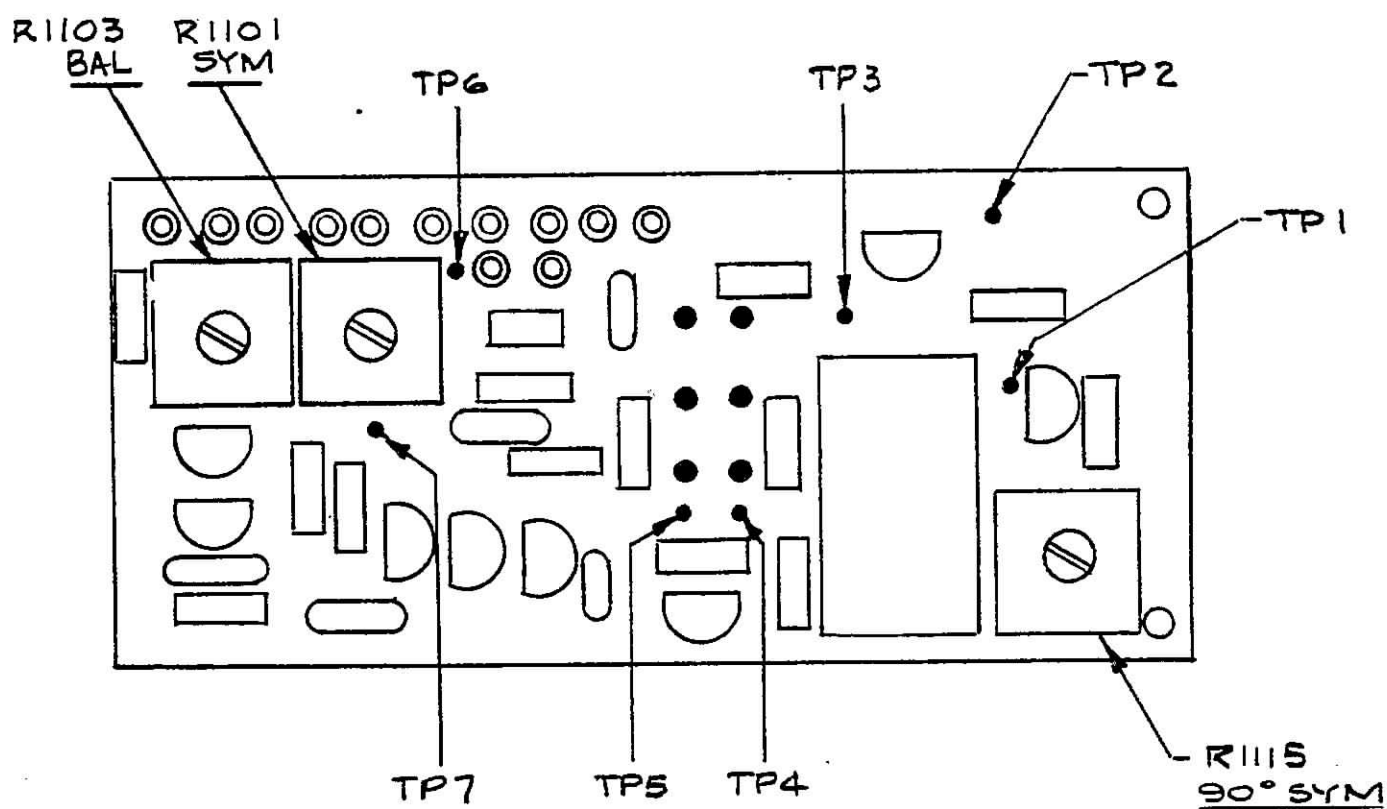
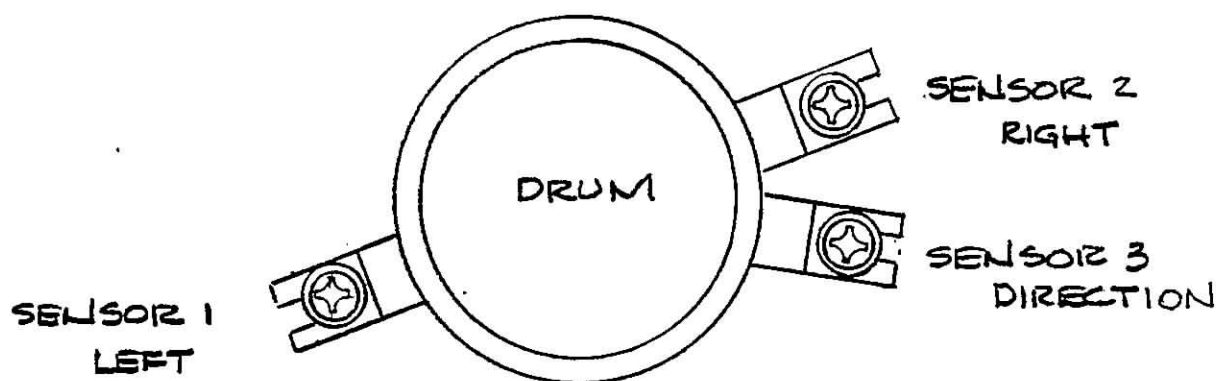


13. Run deck in rewind mode. The left side of the scope trace should now start with the negative portion of the square wave. If the slope of the square wave shows at the start of the trace, readjust Sensor 3. For better clarity of waveform, increase scope sweep speed.

14. Run deck in fast forward mode. Trace should start with the positive portion of the square wave during acceleration and deceleration. If the slope of the square wave shows at the start of the trace, readjust Sensor 3.

Sensor alignment is complete when, with deck operating at any shuttle speed in either direction, scope trace starts with no slope showing.

11-17-79 JFS



MR B3

Audities. Org

~~MR B3~~

Stevens Test 01 7/23/14

Rewind Works

↳ Stop works but right reel strays
Play & Fast forward engage but no spinning tape

Transistors in power supply → motors

(Q16 & Q22) 2 separate - NTE 180/892F

2 together = P312/ECG 180/185/9547

(check first) Shotgun test transport switch transistors
(Dynamic control) (elo switches)

↳ Transistors on switches =

TI ~~1802~~ (TIC 44)
7322

ECG 5401

NTE180 (PNP) & NTE181 (NPN) Silicon Power Transistor High Power Audio Amplifier

Description:

The NTE180 (PNP) and NTE181 (NPN) are silicon complementary transistors in a TO3 type case designed for use as output devices in complementary audio amplifiers to 100 watts music power per channel.

Features:

- High DC Current Gain: $h_{FE} = 25 - 100$ @ $I_C = 7.5A$
- Excellent Safe Operating Area

Absolute Maximum Ratings:

| | |
|---|-------------------------------|
| Collector-Emitter Voltage, V_{CER} | 100V |
| Collector-Base Voltage, V_{CB} | 100V |
| Collector-Emitter Voltage, V_{CEO} | 90V |
| Emitter-Base Voltage, V_{EB} | 4V |
| Collector Current, I_C | 30A |
| Base Current, I_B | 7.5A |
| Total Device Dissipation ($T_C = +25^\circ C$), P_D | 200W |
| Derate Above $25^\circ C$ | 1.14W/ $^\circ C$ |
| Operating Junction Temperature Range, T_J | -65° to $+200^\circ C$ |
| Storage Temperature Range, T_{stg} | -65° to $+200^\circ C$ |
| Thermal Resistance, Junction-to-Case, R_{thJC} | 0.875 $^\circ C/W$ |

Electrical Characteristics: ($T_C = +25^\circ C$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|----------------|--|-----|-----|-----|------|
| OFF Characteristics | | | | | | |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CER}$ | $I_C = 200mA$, $R_{BE} = 100\Omega$, Note 1 | 100 | — | — | V |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 200mA$, Note 1 | 90 | — | — | V |
| Collector-Base Cutoff Current | I_{CBO} | $V_{CB} = 100V$, $I_E = 0$ | — | — | 1.0 | mA |
| | | $V_{CB} = 100V$, $I_E = 0$, $T_C = +150^\circ C$ | — | — | 5.0 | mA |
| Emitter-Base Cutoff Current | I_{EBO} | $V_{BE} = 4V$, $I_C = 0$ | — | — | 1.0 | mA |

Note 1. Pulse Test: Pulse Width $\leq 300\mu s$. Duty Cycle $\leq 2\%$.

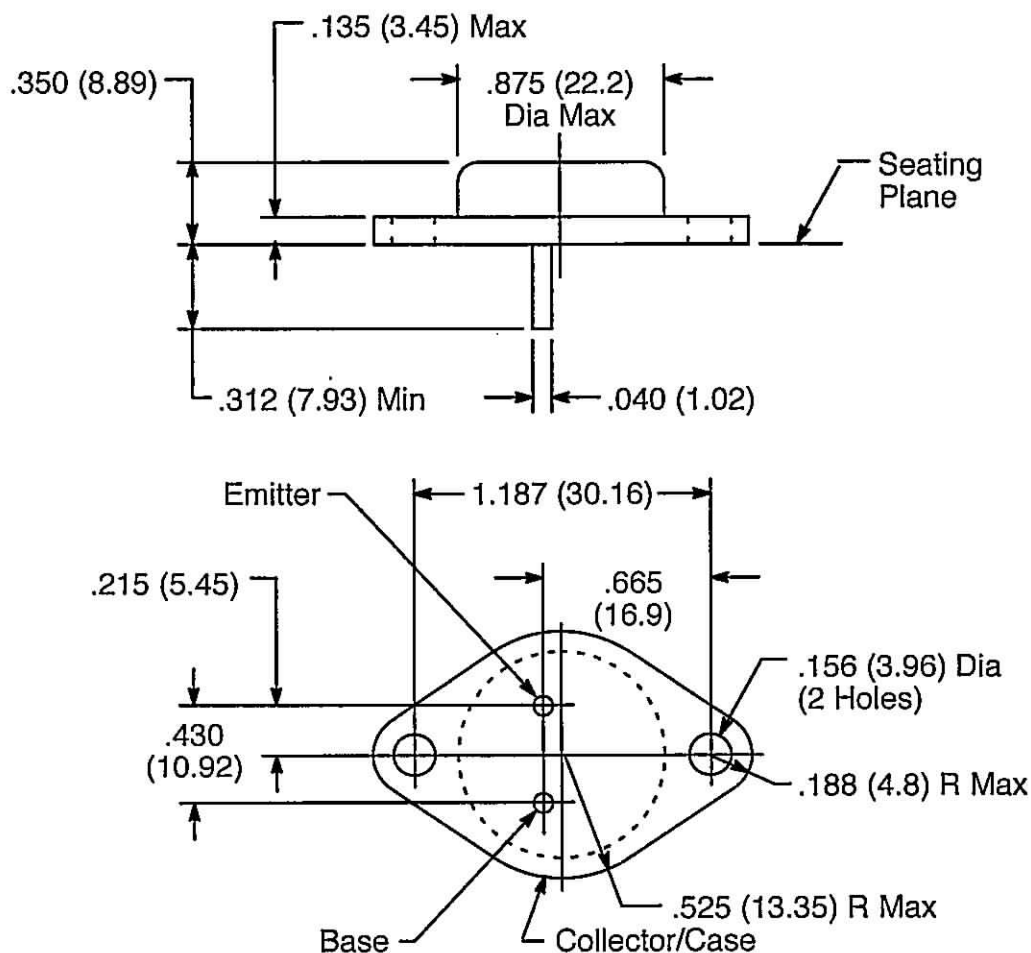
Electrical Characteristics (Cont'd): ($T_C = +25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|---|-----|-----|-----|------|
| ON Characteristics (Note 1) | | | | | | |
| DC Current Gain | h_{FE} | $I_C = 7.5\text{A}$, $V_{CE} = 2\text{V}$ | 25 | — | 100 | |
| Base-Emitter ON Voltage | $V_{BE(on)}$ | $I_C = 7.5\text{A}$, $V_{CE} = 2\text{V}$ | — | — | 1.3 | V |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 7.5\text{A}$, $I_B = 750\text{mA}$ | — | — | 0.8 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 7.5\text{A}$, $I_B = 750\text{mA}$ | — | — | 1.3 | V |
| Dynamic Characteristics | | | | | | |
| Current Gain-Bandwidth Product | f_T | $I_C = 1\text{A}$, $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$ | 2.0 | — | — | MHz |

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$. Duty Cycle $\leq 2\%$.

Note 2. NTE181MP is a matched pair of NTE181 with their DC Current Gain (h_{FE}) matched to within 10% of each other.

Note 3. NTE180MCP is a matched complementary pair containing 1 each of NTE180 (PNP) and NTE181 (NPN).



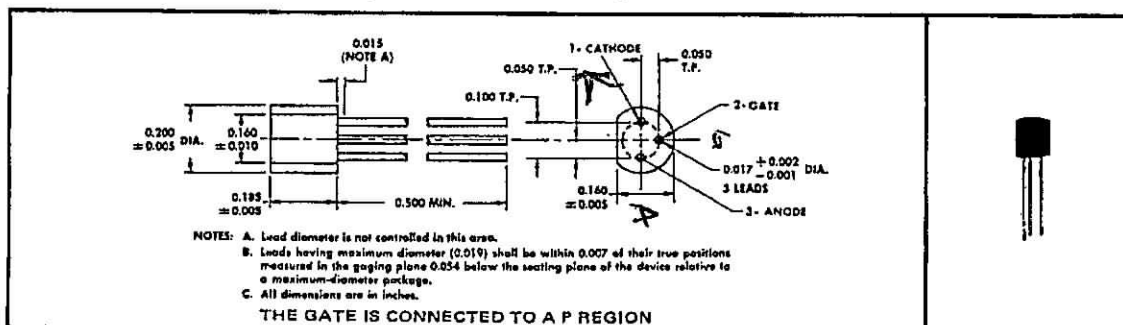
TYPES TIC44, TIC45, TIC46, TIC47 P-N-P-N PLANAR SILICON REVERSE-BLOCKING TRIODE THYRISTORS

SELECT† THYRISTORS‡
600 mA DC • 30 thru 200 VOLTS

Rugged, One-Piece Construction with Standard TO-18 100-mil Pin-Circle Configuration

Mechanical Data

These thyristors are encapsulated in a plastic compound specifically designed for this purpose, using a highly mechanized process developed by Texas Instruments. The case will withstand soldering temperatures without deformation. These devices exhibit stable characteristics under high-humidity conditions and are capable of meeting MIL-STD-202C method 106B. The thyristors are insensitive to light.



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

| | TIC44 | TIC45 | TIC46 | TIC47 | UNIT |
|--|------------|-------|-------|-------|------|
| Static Off-State Voltage, V_D (See Note 1) | 30 | 60 | 100 | 200 | V |
| Repetitive Peak Off-State Voltage, V_{DRM} (See Note 1) | 30 | 60 | 100 | 200 | V |
| Static Reverse Voltage, V_R (See Note 1) | 30 | 60 | 100 | 200 | V |
| Repetitive Peak Reverse Voltage, V_{RRM} (See Note 1) | 30 | 60 | 100 | 200 | V |
| Continuous or RMS On-State Current at (or below) 55°C Case Temperature (See Note 2) | 600 | | | | mA |
| Continuous or RMS On-State Current at (or below) 25°C Free-Air Temperature (See Note 3) | 300 | | | | mA |
| Average On-State Current (180° Conduction Angle) at (or below) 55°C Case Temperature (See Note 4) | 430 | | | | mA |
| Surge On-State Current (See Note 5) | 6 | | | | A |
| Peak Negative Gate Voltage | 8 | | | | V |
| Peak Positive Gate Current (Pulse Width < 300 μ s) | 1 | | | | A |
| Peak Gate Power Dissipation (Pulse Width < 300 μ s) | 4 | | | | W |
| Operating Free-Air Temperature Range | -55 to 125 | | | | °C |
| Storage Temperature Range | -55 to 150 | | | | °C |
| Lead Temperature 1/16 Inch from Case for 10 Seconds | 260 | | | | °C |

- NOTES: 1. These values apply when the gate-cathode resistance $R_{GK} < 1 \text{ k}\Omega$.
2. These values apply for continuous d-c operation with resistive load. Above 55°C derate according to Figure 5.
3. These values apply for continuous d-c operation with resistive load. Above 25°C derate according to Figure 6.
4. This value may be applied continuously under single-phase, 60-Hz, half-sine-wave operation with resistive load. Above 55°C derate according to Figure 5.
5. This value applies for one 60-Hz half sine wave when the device is operating at (or below) rated values of peak reverse voltage and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

†Trademark of Texas Instruments

‡U. S. Patent No. 3,439,238

TYPES TIC44, TIC45, TIC46, TIC47

P-N-P-N PLANAR SILICON REVERSE-BLOCKING TRIODE THYRISTORS

electrical characteristics at 25°C free-air temperature (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | MIN | MAX | UNIT |
|--|--|-----|-----|---------------|
| I_D Static Off-State Current | $V_D = \text{Rated } V_D, R_{GK} = 1 \text{ k}\Omega, T_A = 125^\circ\text{C}$ | 50 | | μA |
| I_R Static Reverse Current | $V_R = \text{Rated } V_R, R_{GK} = 1 \text{ k}\Omega, T_A = 125^\circ\text{C}$ | 50 | | μA |
| I_{GT} Gate Trigger Current (See Note 6) | $V_{AA} = 6 \text{ V}, R_L = 100 \Omega, t_{p(g)} > 20 \mu\text{s}$ | 200 | | μA |
| V_{GT} Gate Trigger Voltage (See Note 6) | $V_{AA} = 6 \text{ V}, R_L = 100 \Omega, t_{p(g)} > 20 \mu\text{s}$ | 0.8 | | V |
| | $V_{AA} = 6 \text{ V}, R_L = 100 \Omega, t_{p(g)} > 20 \mu\text{s}, T_A = 125^\circ\text{C}$ | 0.2 | | |
| I_H Holding Current | $R_L = 100 \Omega, R_{GK} = 1 \text{ k}\Omega$ | 5 | | mA |
| V_T On-State Voltage | $I_T = 300 \text{ mA}, R_{GK} \geq 1 \text{ k}\Omega, \text{ See Note 7}$ | 1.4 | | V |

NOTES: 6. When measuring these parameters, a 1-k Ω resistor should be used between gate and cathode to prevent triggering by random noise.

7. This parameter is measured using pulse techniques. $t_w = 1 \text{ ms}$, duty cycle $\leq 1\%$.

switching characteristics at 25°C free-air temperature

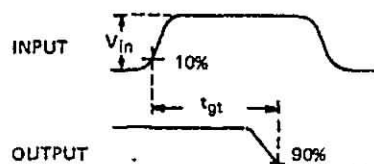
| PARAMETER | TEST CONDITIONS | TYP | UNIT |
|--|---|-----|---------------|
| t_{gt} Gate-Controlled Turn-On Time | $V_{AA} = 30 \text{ V}, R_L = 50 \Omega, R_G = 20 \text{ k}\Omega, V_{in} = 20 \text{ V}, \text{ See Figure 1}$ | 3.5 | μs |
| t_q Circuit-Commutated Turn-Off Time | $V_{AA} = 30 \text{ V}, R_L = 50 \Omega, I_{RM} = 1 \text{ A}, \text{ See Figure 2}$ | 6.8 | μs |

thermal characteristics

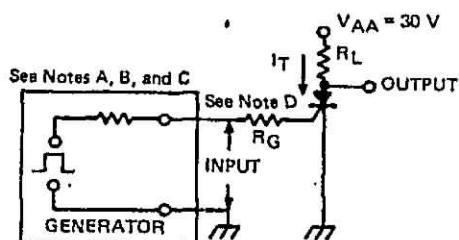
| PARAMETER | MAX | UNIT |
|---|-----|--------------------|
| $R_{\theta JC}$ Junction-to-Case Thermal Resistance | 75 | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ Junction-to-Free-Air Thermal Resistance | 275 | |

TYPES TIC44, TIC45, TIC46, TIC47 **P-N-P-N PLANAR SILICON REVERSE-BLOCKING TRIODE THYRISTORS**

PARAMETER MEASUREMENT INFORMATION



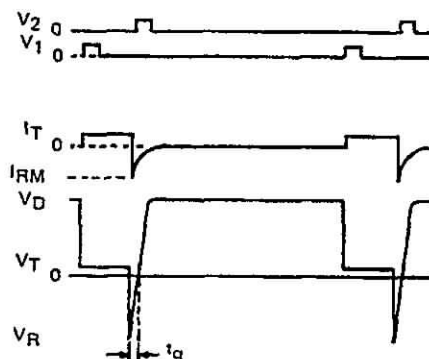
VOLTAGE WAVEFORMS



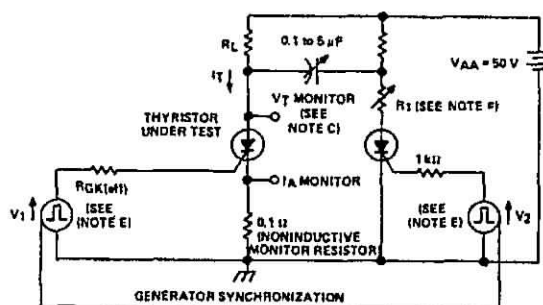
TEST CIRCUIT

FIGURE 1—TURN-ON TIME

- NOTES: A. V_{in} is measured with gate and cathode terminals connected as shown and anode terminal open.
 B. The input waveform of Figure 1 has the following characteristics: $t_r \leq 40$ ns, $t_w \geq 20$ μ s.
 C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 14$ ns, $R_{in} \geq 10$ M Ω , $C_{in} \leq 12$ pF.
 D. R_G includes the total resistance of the generator and the external resistor.



WAVEFORMS



TEST CIRCUIT

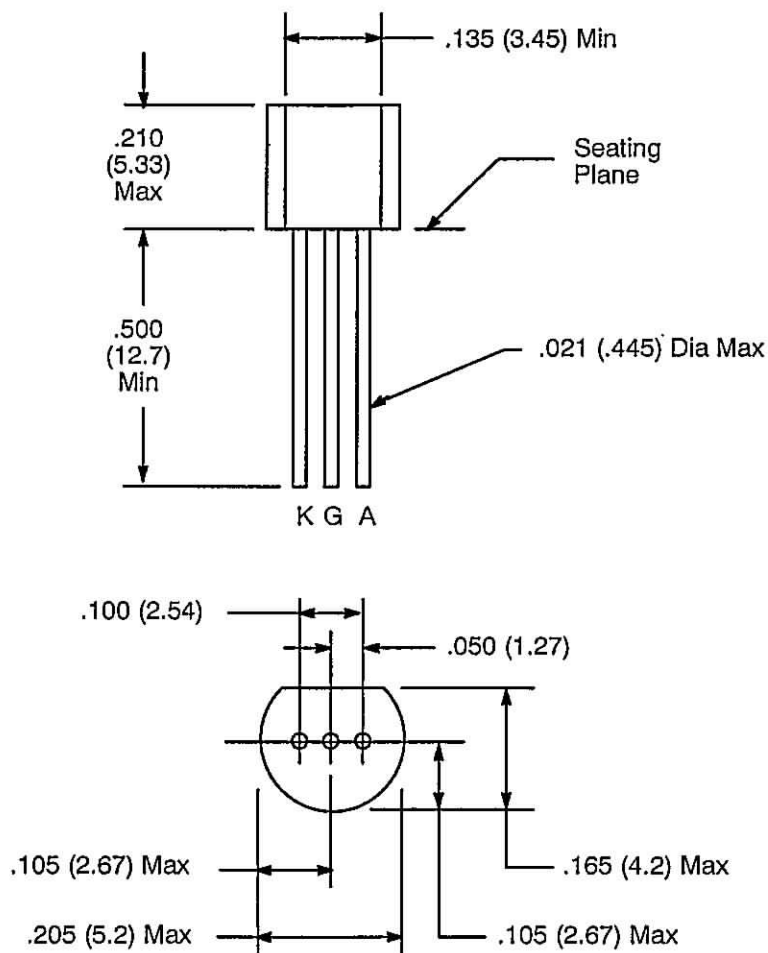
FIGURE 2—COMMUTATING TURN-OFF TIME

- NOTES: E. Pulse generators for V_1 and V_2 are synchronized to provide an anode current waveform with the following characteristics: $t_w = 50$ to 300 μ s, duty cycle = 1%. The pulse widths of V_1 and V_2 are ≥ 10 μ s.
 F. Resistor R_1 is adjusted for $I_{RM} = 1$ A.

Electrical Characteristics:

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--|-----------------------|---|-----|-----|------|------------------------|
| Peak Off-State Current | I_{RRM} | $V_{RRM} = \text{Max}, V_{DRXM} = \text{Max},$ $T_C = +100^\circ\text{C}, R_{G-K} = 1\text{k}\Omega$ | - | - | 50 | μA |
| | I_{DRXM} | | - | - | 50 | μA |
| Maximum On-State Voltage | V_{TM} | $T_C = +25^\circ\text{C}, I_T = 1.2\text{A (Peak)}$ | - | - | 1.7 | V |
| DC Holding Current | I_{HOLD} | $T_C = +25^\circ\text{C}$ | - | - | 5 | mA |
| DC Gate-Trigger Current | I_{GT} | $V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$ | - | 50 | 200 | μA |
| DC Gate-Trigger Voltage | V_{GT} | $V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$ | - | - | 0.8 | V |
| I^2t for Fusing Reference | I^2t | $> 1.5\text{msoc}$ | - | - | 0.15 | A^2sec |
| Critical Rate of Applied Forward Voltage | dv/dt (critical) | $T_C = +100^\circ\text{C}$ | - | 5 | - | $\text{V}/\mu\text{s}$ |

Anode
Gate
Cathode





ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748-5089
<http://www.nteinc.com>

NTE5400 thru NTE5406 Silicon Controlled Rectifier (SCR) 0.8 Amp Sensitive Gate, TO92

Description:

The NTE5400 through NTE5406 sensitive gate SCR semiconductors are halfwave unidirectional gate controlled rectifiers (SCR-thyristor) rated at 0.8 amps RMS maximum on-state current, with rated voltages up to 600 volts.

These devices feature 200 microamp gate sensitivity, 5 millamp holding current and 8 amp surge capabilities.

Available in a TO92 plastic package, these devices feature excellent environmental stress and temperature cycling characteristics and, coupled with their small size and electrical performance, lend themselves to various types of control functions encountered with sensors, motors, lamps, relays, counters, triggers, etc.

Absolute Maximum Ratings:

Repetitive Peak Reverse Voltage ($T_C = +100^\circ\text{C}$), V_{RRM}

| | |
|---------|------|
| NTE5400 | 30V |
| NTE5401 | 60V |
| NTE5402 | 100V |
| NTE5403 | 150V |
| NTE5404 | 200V |
| NTE5405 | 400V |
| NTE5406 | 600V |

Repetitive Peak Off-State Voltage ($T_C = +100^\circ\text{C}$), V_{DRXM}

| | |
|---------|------|
| NTE5400 | 30V |
| NTE5401 | 60V |
| NTE5402 | 100V |
| NTE5403 | 150V |
| NTE5404 | 200V |
| NTE5405 | 400V |
| NTE5406 | 600V |

RMS On-State Current, $I_{T(RMS)}$ 0.8A

Peak Surge (Non-Repetitive) On-State Current (One Cycle at 50 or 60Hz), I_{TSM} 8A

Peak Gate-Trigger Current ($3\mu\text{s}$ Max), I_{GTM} 500mA

Peak Gate-Power Dissipation ($I_{GT} \leq I_{GTM}$ for $3\mu\text{s}$ Max), P_{GM} 20W

Average Gate Power Dissipation, $P_{G(AV)}$ 200mW

Operating Temperature Range, T_{opr} -40° to $+100^\circ\text{C}$

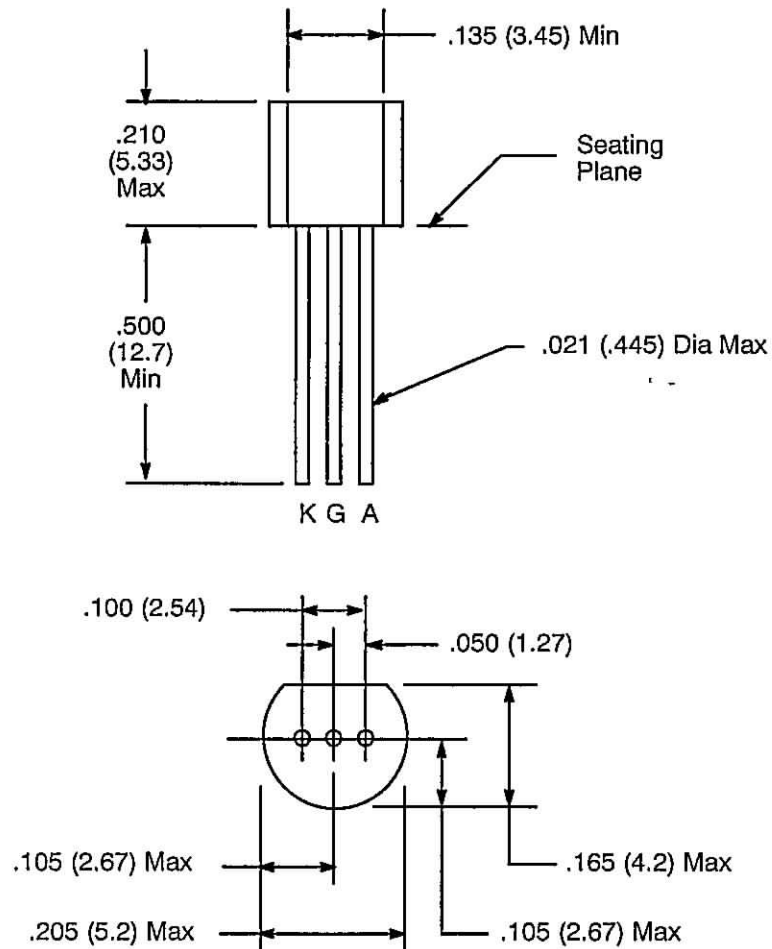
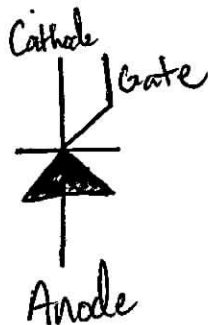
Storage Temperature Range, T_{stg} -40° to $+150^\circ\text{C}$

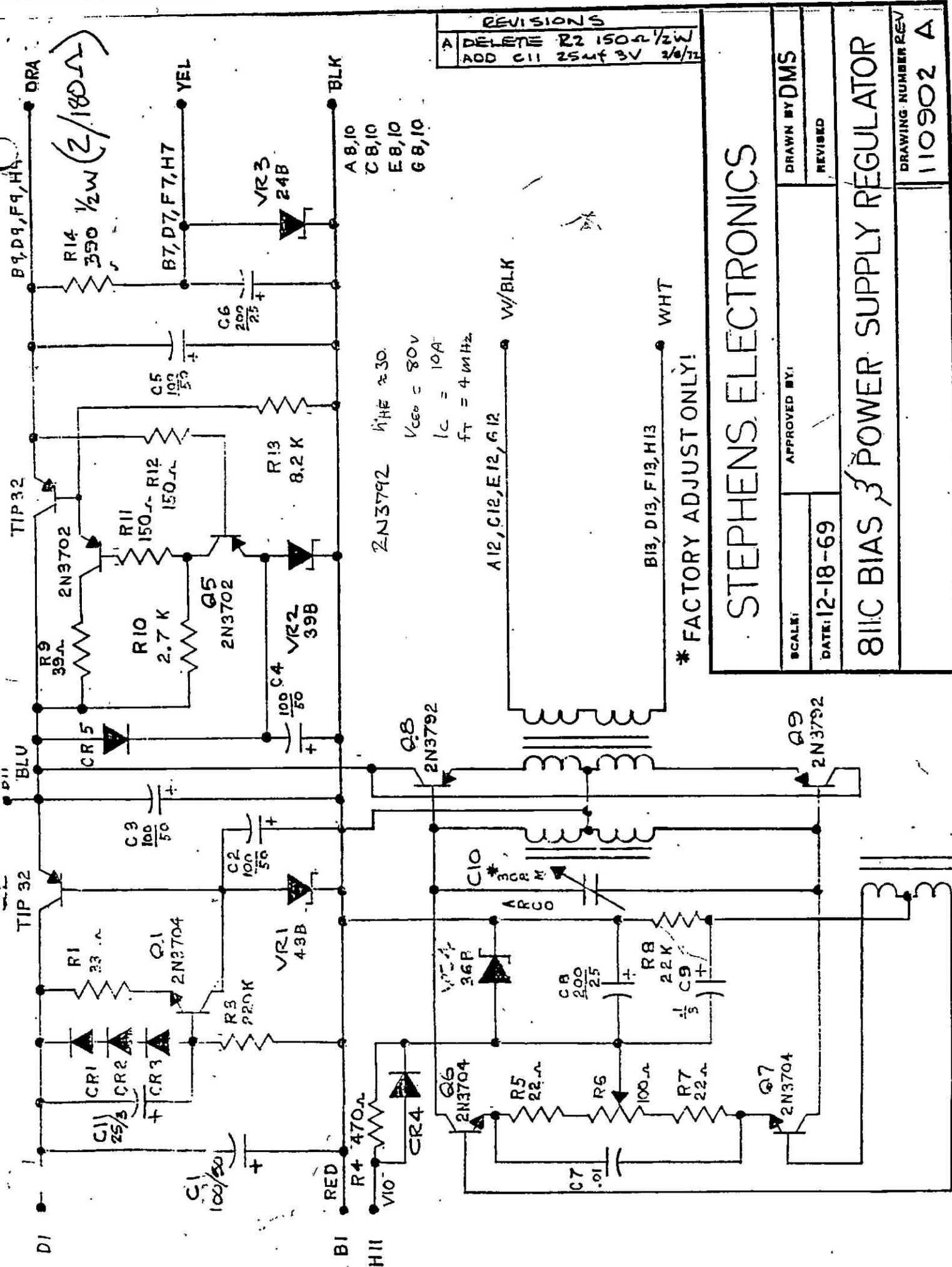
Typical Thermal Resistance, Junction-to-Case, R_{thJC} $+5^\circ\text{C/W}$

Typical Thermal Resistance, Junction-to-Ambient, R_{thJA} $+200^\circ\text{C/W}$

Electrical Characteristics:

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--|-----------------------|---|-----|-----|------|------------------------|
| Peak Off-State Current | I_{RRM} | $V_{RRM} = \text{Max}, V_{DRXM} = \text{Max},$ $T_C = +100^\circ\text{C}, R_{G-K} = 1\text{k}\Omega$ | — | — | 50 | μA |
| | I_{DRXM} | | — | — | 50 | μA |
| Maximum On-State Voltage | V_{TM} | $T_C = +25^\circ\text{C}, I_T = 1.2\text{A (Peak)}$ | — | — | 1.7 | V |
| DC Holding Current | I_{HOLD} | $T_C = +25^\circ\text{C}$ | — | — | 5 | mA |
| DC Gate-Trigger Current | I_{GT} | $V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$ | — | 50 | 200 | μA |
| DC Gate-Trigger Voltage | V_{GT} | $V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$ | — | — | 0.8 | V |
| I^2t for Fusing Reference | I^2t | $> 1.5\text{msoc}$ | — | — | 0.15 | A^2sec |
| Critical Rate of Applied Forward Voltage | dv/dt (critical) | $T_C = +100^\circ\text{C}$ | — | 5 | — | $\text{V}/\mu\text{s}$ |





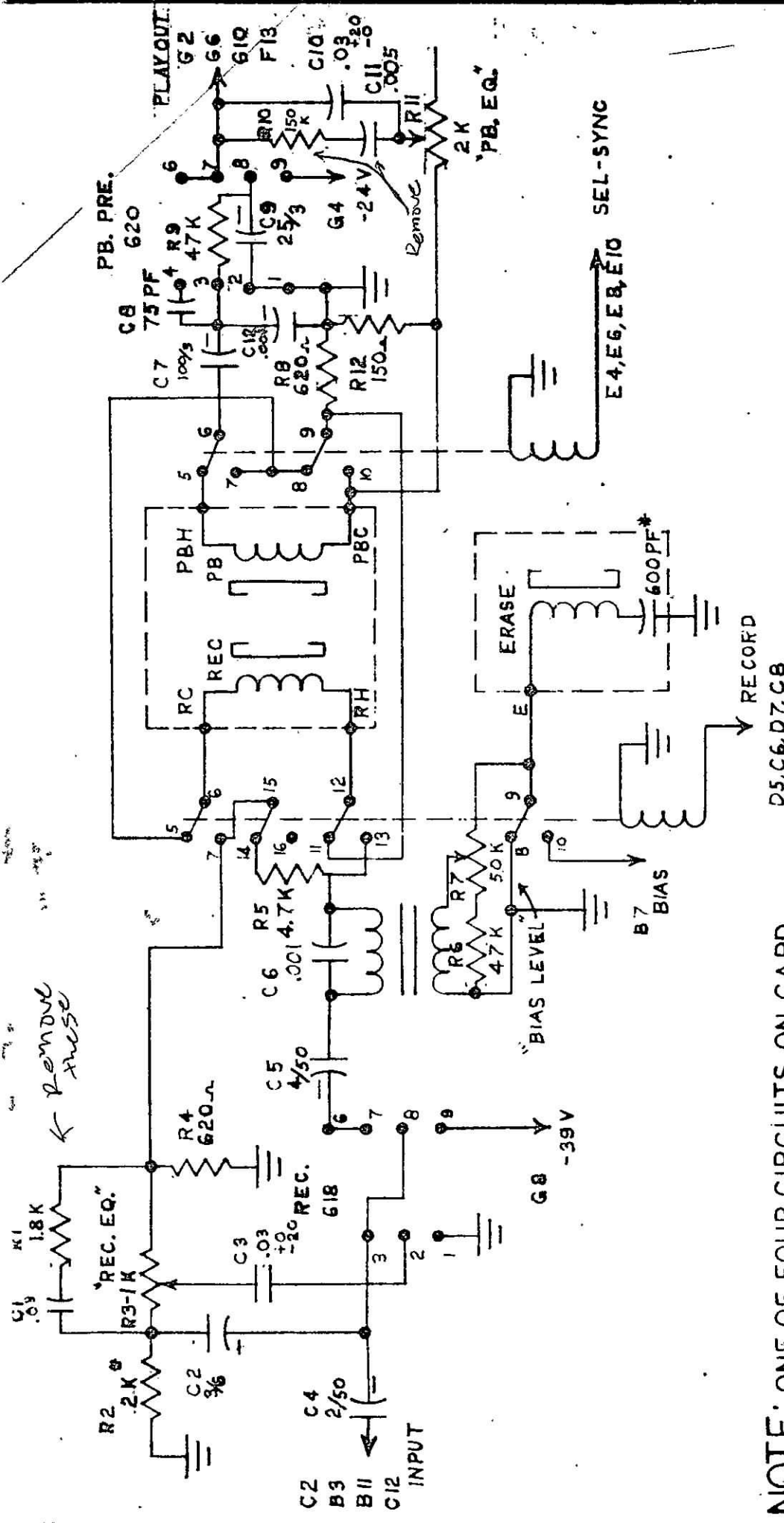
| REVISIONS | |
|-----------|------------------------|
| A | DELETE R2 150Ω 1/2W |
| | ADD C11 25μf 3V 2/8/72 |

STEPHENS ELECTRONICS

| | | |
|------------------------------------|--------------|--------------|
| SCALE: | APPROVED BY: | DRAWN BY DMS |
| DATE: 12-18-69 | | REVISED |
| 811C BIAS 3 POWER SUPPLY REGULATOR | | |
| DRAWING NUMBER REV | | 110902 A |

* FACTORY ADJUST ONLY!

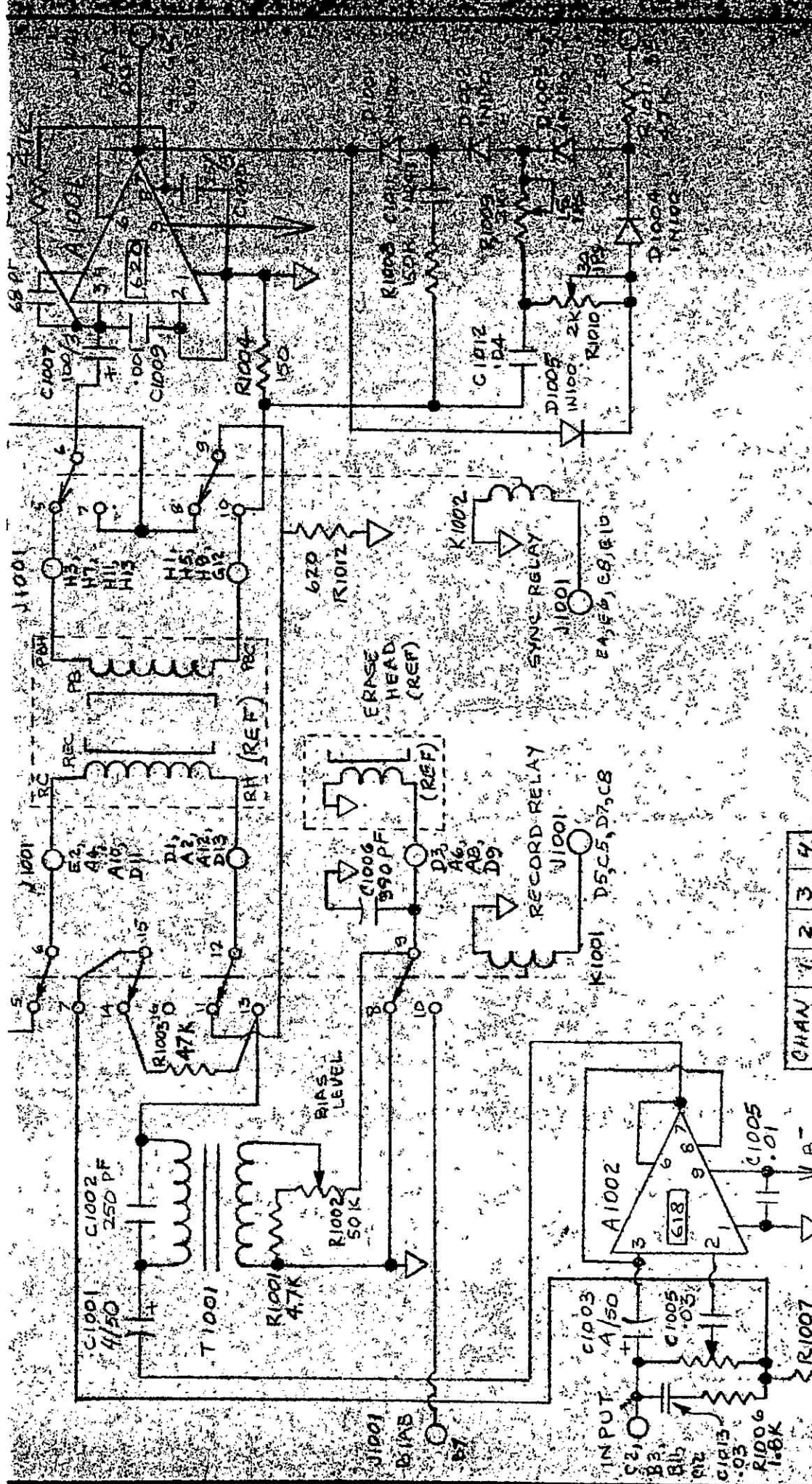
$V_{CE} = 80V$
 $I_C = 10A$
 $f_T = 4MHz$



NOTE: ONE OF FOUR CIRCUITS ON CARD.
 * ADJUSTED DURING FINAL ASSEMBLY.

| CHAN. | 1 | 2 | 3 | 4 |
|-------|----|----|-----|-----|
| RC | E2 | A4 | A10 | D11 |
| RH | D1 | A2 | A1E | D3 |
| PBC | H1 | H5 | H9 | D12 |
| PBH | H3 | H7 | H11 | H13 |
| E | D3 | A6 | A8 | D2 |

| | | | |
|----------------------|--|----------------|--|
| STEPHENS ELECTRONICS | | DRAWN BY DMS | |
| | | REVISED | |
| APPROVED BY: | | DATE: 12-22-69 | |
| PRE AMP. ELECTRONICS | | | |
| 811C-3000 | | DRAWING NUMBER | |



| CHAN | 1 | 2 | 3 | 4 |
|------|----|----|-----|-----|
| RC | E2 | A4 | A10 | D11 |
| RH | D1 | A2 | A12 | D3 |
| PBC | H1 | H5 | H9 | G12 |
| PBH | H3 | H7 | H11 | H13 |
| E | D3 | A6 | A8 | D9 |

ANALOGUE COMM.
PINK NUMBERS
CARRYING SIGNAL
TO HEAD STACK

STEPHENS ELECTRONICS INC.

APPROVED BY: _____

DATE: 6/6/76

8H-D 3100

FROM DETECTOR SWICOR

TO SEL SYNC SWITCH FOR OUT PDM SELECT

B5, D7, E8, H7

PLAY INPUT

A6, C6, E6, H5
CH. 4/8 3/4 2/6 1/5

TO REC AMP

A2, C2, D3, G2,
4/8 3/7 2/6 1/5

REC INPUT

B1, D1, H1, E2
CH. 4/8 3/4 1/5 2/6

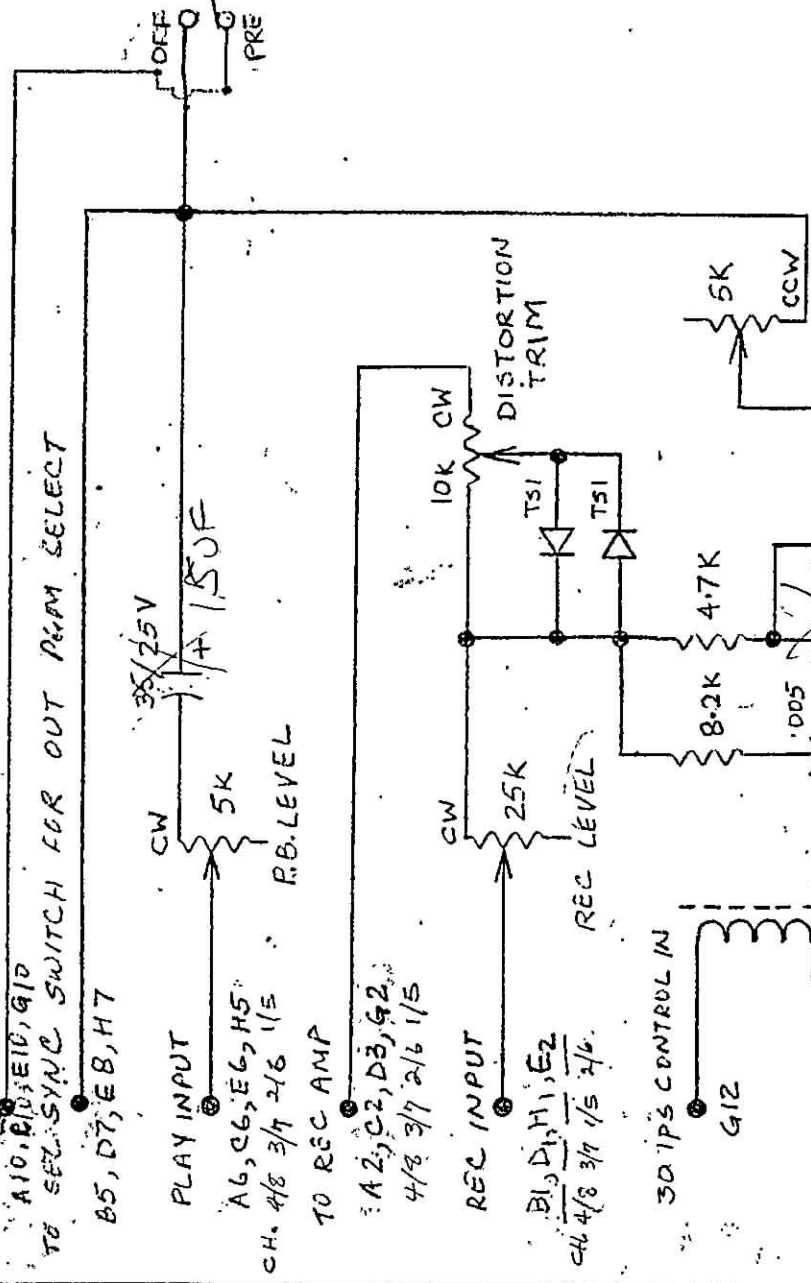
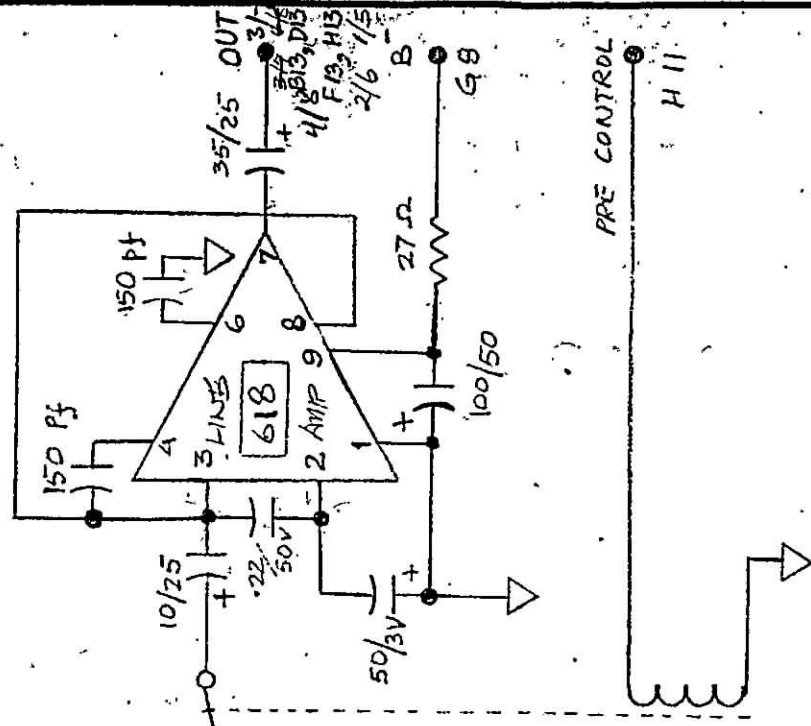
30 IPS CONTROL IN

G12

REC LEVEL

DISTORTION TRIM

PLAY L.F. EQ



VERIFIED CORRECT BY L.C.F.

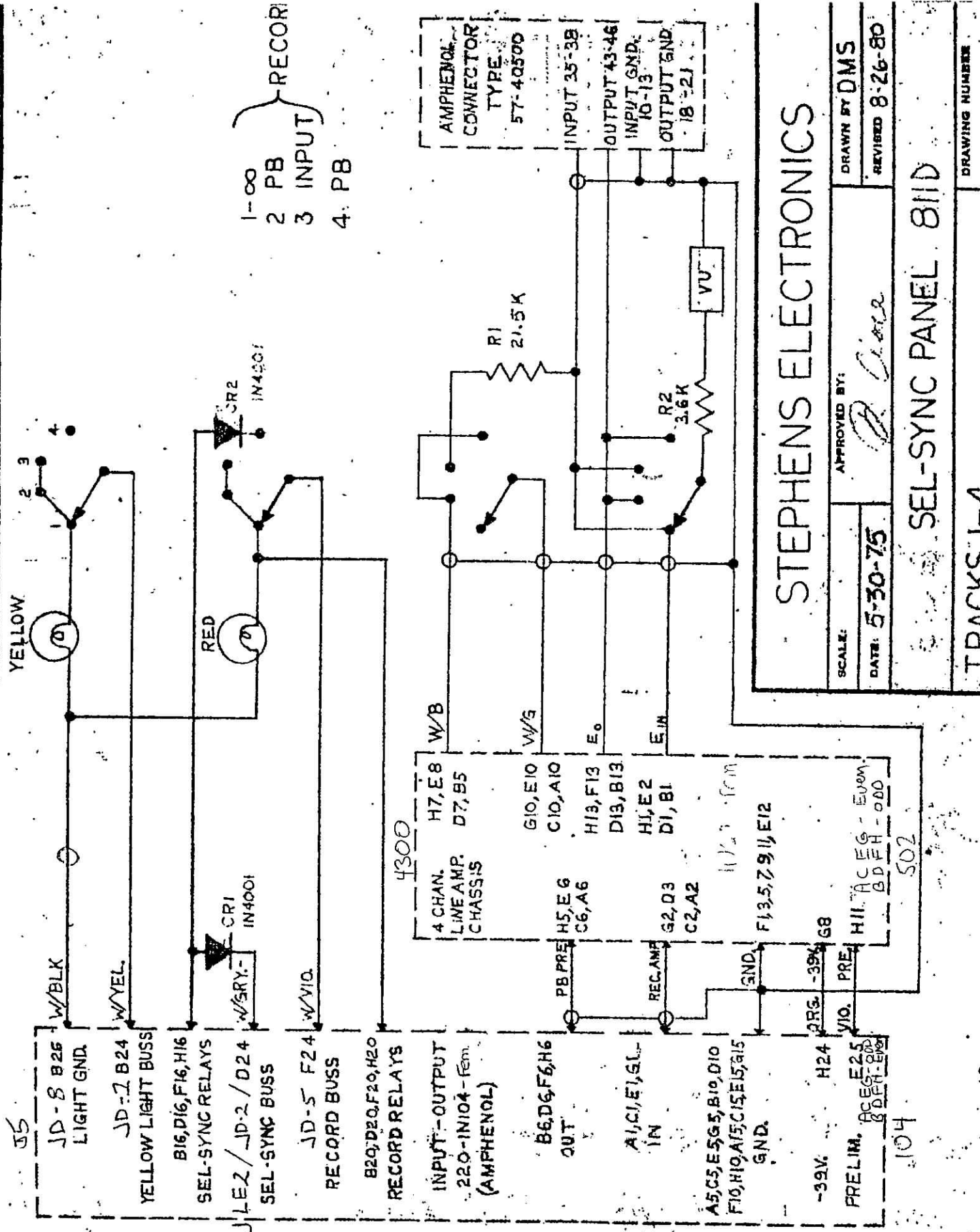
STEPHENS ELECTRONICS INC

- NOTES
1. BOTH RELAYS ARE ENERGISED
 2. RELAYS ARE COMMON TO ALL CHANNELS
 3. PIN NUMBERS ARE FOR GREEN AMPHONCEL CONNECTORS
 4. ALL RESISTOR VALUES ARE 1/4 WATT

| | | |
|---------------|-------------|----------|
| SCALE | APPROVED BY | DRAWN BY |
| DATE: 5-30-75 | | LAB |
| | | REVISED |

4300 LINE AMPLIFIER CARD

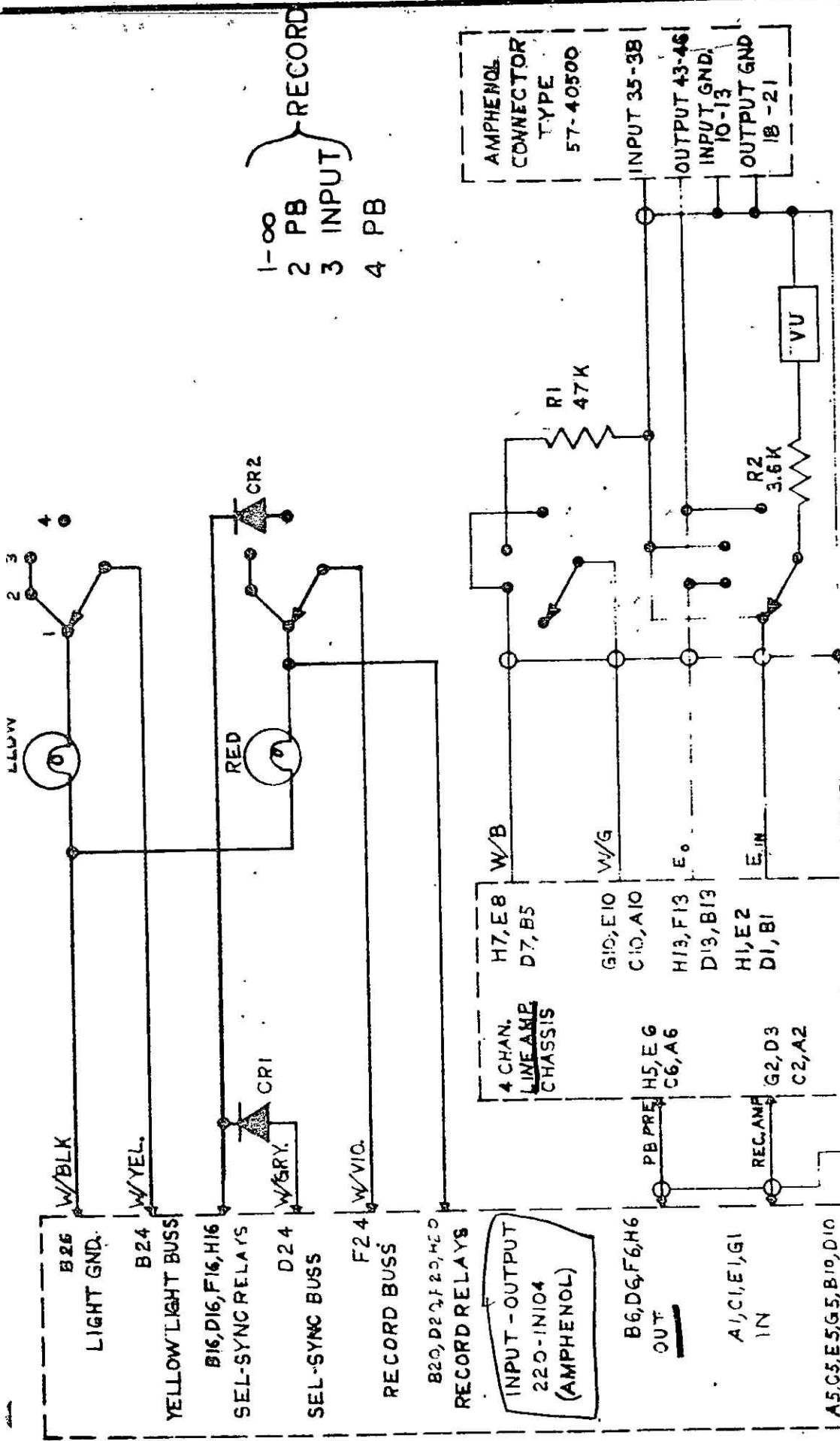
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| FOR 811-P ELECTRONICS | DRAWING NUMBER |
| | 110932-A |



STEPHENS ELECTRONICS

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| SCALE: | APPROVED BY: | DRAWN BY DMS |
| DATE: 5-30-75 | <i>R. C. C.</i> | REVISED 8-26-80 |
| SEL-SYNC PANEL 811D | | |
| DRAWING NUMBER | | |

TDAKCL-1



STEPHENS ELECTRONICS

811C-16 SEL-SYNC PANEL

TRACKS 1-4

AMPHENOL CONNECTOR TYPE 57-40500

INPUT 35-38

OUTPUT 43-46

INPUT GND. 10-13

OUTPUT GND. 18-21

1-∞

2 PB

3 INPUT

4 PB

RECORD

SCALE:

APPROVED BY:

DATE: 12-22-69

DRAWN BY: DMS

REVISED

DRAWING NUMBER

16 TRACK

[illegible]

ONE OF FOUR CIRCUITS ON CARD.
RELAY COIL COMMON TO ALL FOUR CIRCUITS.

STEPHENS ELECTRONICS

SALE.

APPROVED BY:

DRAWN BY DMS

DATE 12 23-69

REVISID

31C CVT AMPLIFIER

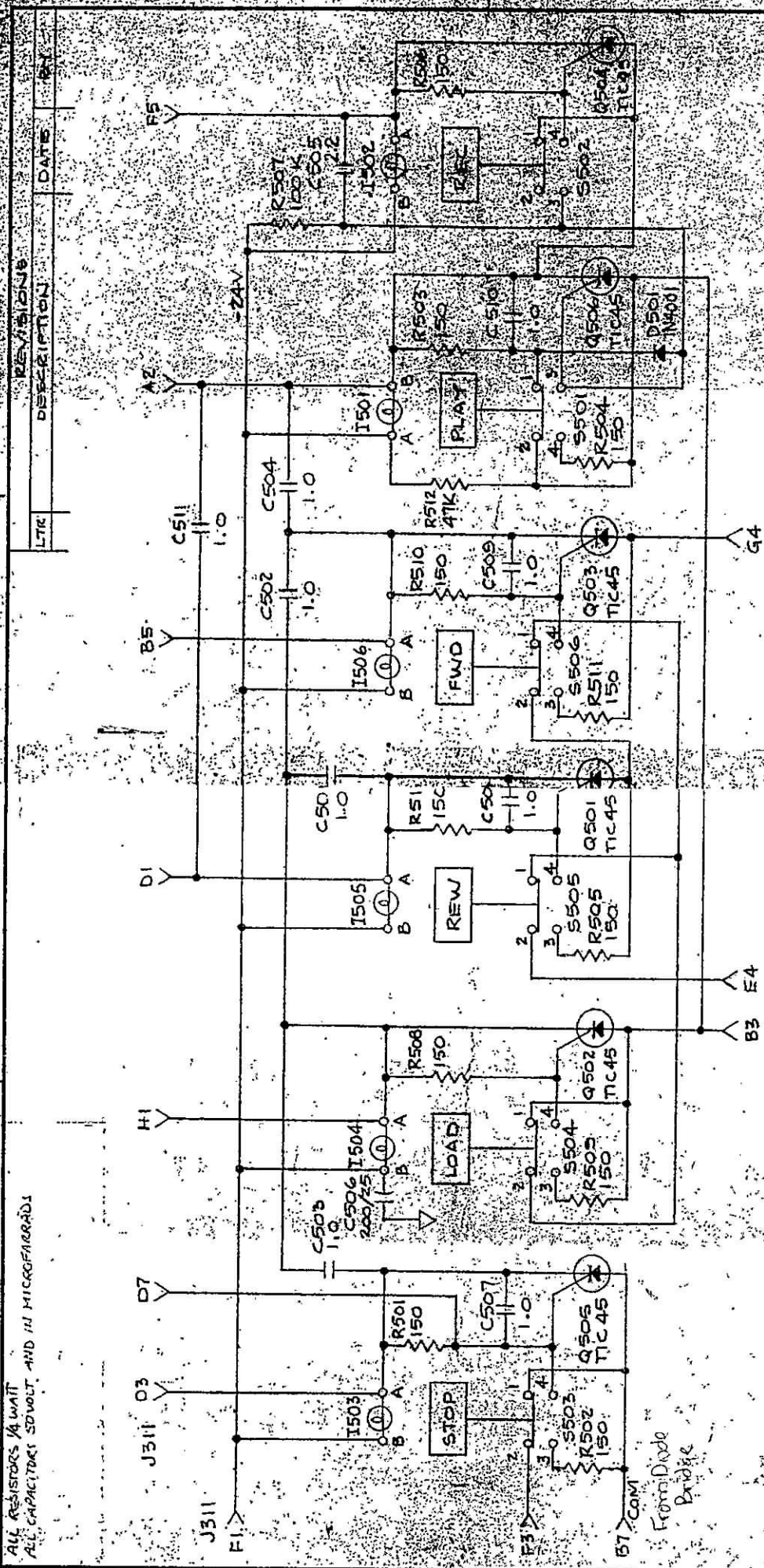
CRAWFORD NUMBER

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2

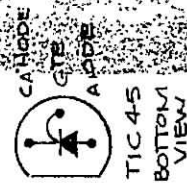
1

ALL RESISTORS 1/4 WATT
ALL CAPACITORS 50VOLT AND 100 MICROFARADS



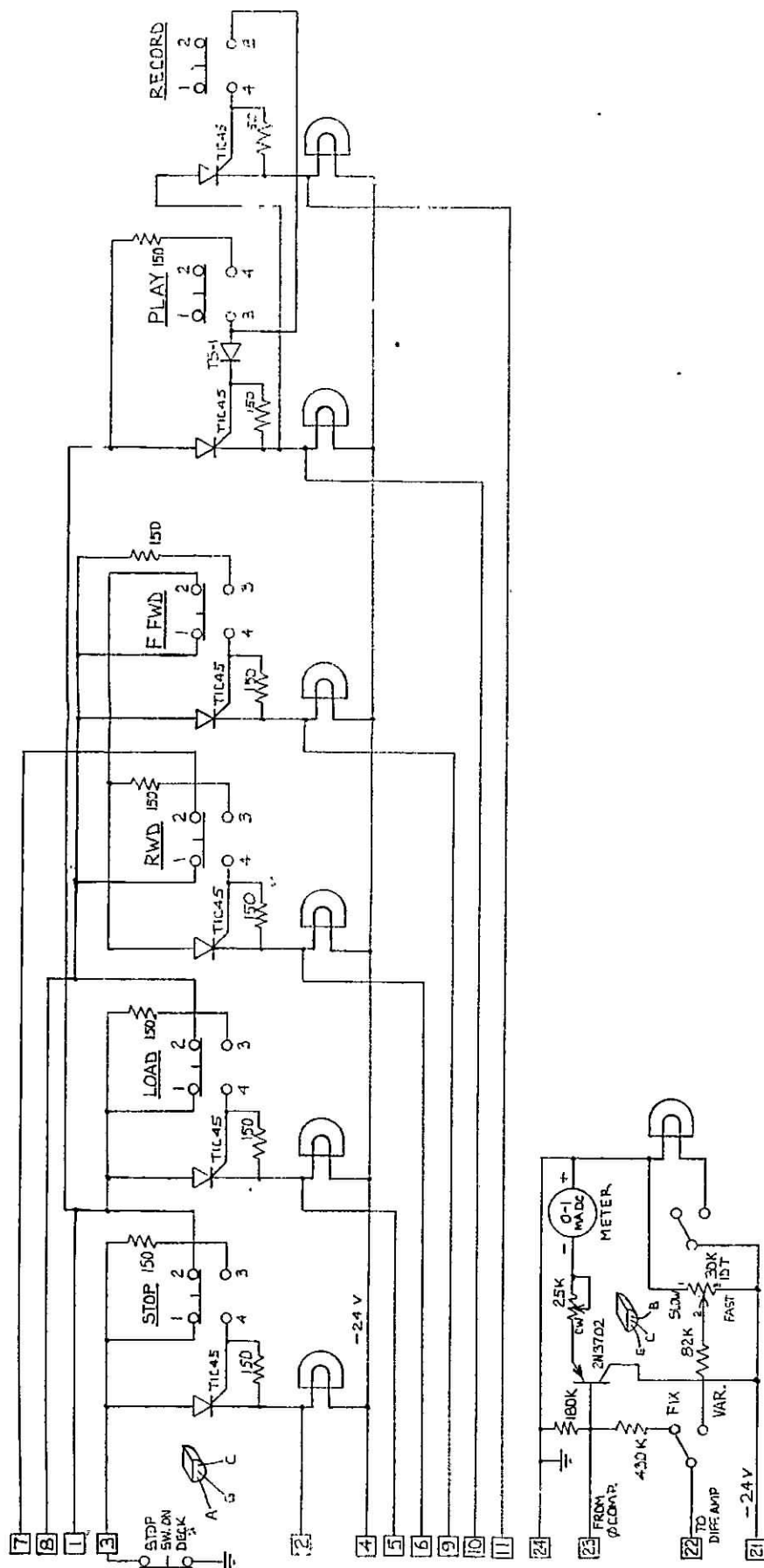
STEPHENS ELECTRONICS, INC.

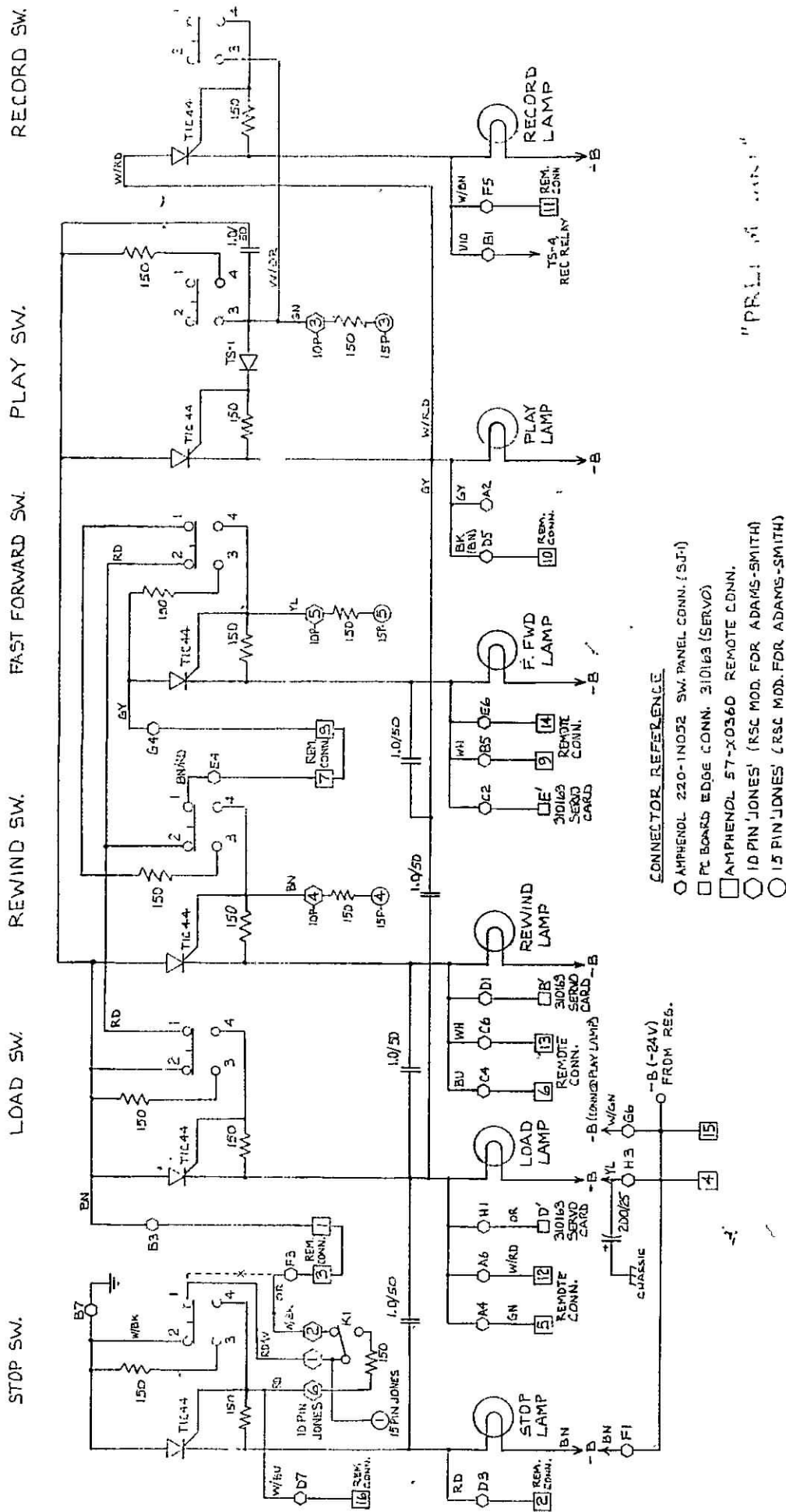
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| SCALE: 1" | APPROVED BY: | DATE: 28 SEP 79 | DESIGNER: JGEE |
| DYNAMIC CONTROLS MODULE | | MODEL: 1038 | FIGURE: 6-19 |
| DRAWING NUMBER: 56-0501 | | | |



| LAST SYM. | NO. |
|-----------|---------|
| C511 | OMITTED |
| D501 | |
| Q506 | |
| R513 | |

11413 PRINTED ON NO. 10050 CLEARFILM





NOTE: USES RSC (RESISTOR-SCR-CAPACITOR) LOGIC.

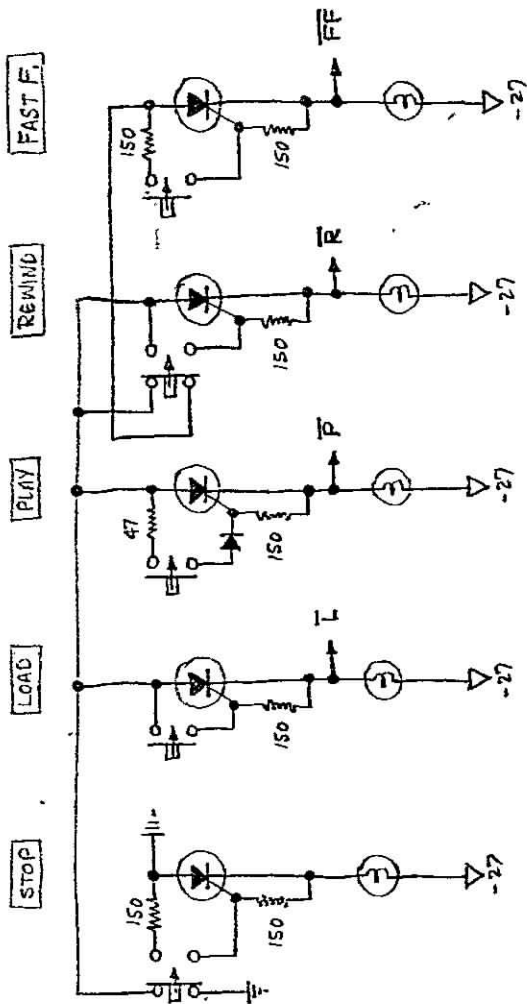
EEB, YVM IE

STEPHENS TRANSPORT CONT'L. DETAIL SCHEMATIC DIAG.
SUPPLEMENT TO TAPE TRANSPORT SCHEMATIC

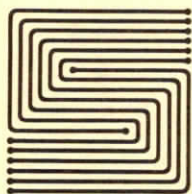
CONNECTOR REFERENCE

- ☐ APPEND 220-1N052 SW. PANEL CONN. (SJT-I)
- ☐ PC BOARD EDGE CONN. 310163 (SERVO)
- ☐ APPEND 57-X0360 REMOTE CONN.
- ☐ 10 PIN 'JONES' (RSC MOD. FOR ADAMS-SMITH)
- ☐ 15 PIN 'JONES' (RSC MOD. FOR ADAMS-SMITH)

* COMMUTATING CAPS NOT SHOWN



42-382 100 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
NATIONAL



STEPHENS ELECTRONICS, INC

technical manual

Alignment Controls
Tape Speed Controls
See inside back cover.

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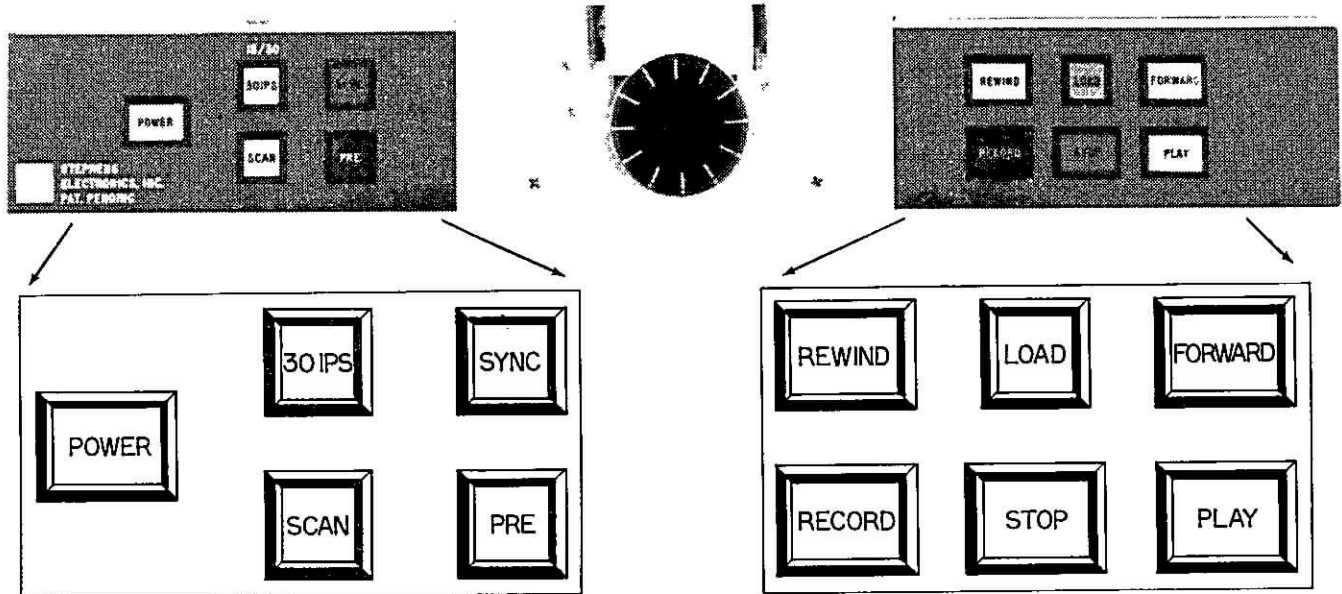
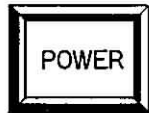


Figure 1-1. Transport Controls

1.1 CONTROLS & INDICATORS

1.1.1 TRANSPORT All transport-mounted controls are illuminated pushbutton switches. Some push-buttons are momentary type and others are alternate-action, but all buttons remain in the up position after being pressed. In some cases, the logic latches the switch function ON or OFF, and the button illumination conforms to the logic status.

DESCRIPTION



Controls the application of power to the transport and the electronics. The button lights when power is ON.



Selects the play/record speed for the transport. Press button for alternate action, 15ips or 30ips. The button is lit in 30ips mode. This button also switches the record/play electronics to conform to the speed selected.



This overrides the 15ips/30ips button and sets the transport for a play/record speed of 60ips. The button is lit when ON. This function is used primarily during playback for rapid location of program cues. For timing purposes, a program may be played at scan speed; the scan time is multiplied by 2 for 30ips play time, and is multiplied by 4 for 15ips play time. Scan may be used for recording, although the equalization remains at the 15ips or 30ips characteristic previously selected.



Switches the play amplifier between two sources, the record head or the play head, depending upon the sync status of the machine. In sync mode the button is lit and the play amp output of all channels is derived from the

record head, which is equal in quality to the play head.

When the machine is placed in record mode, the sync light goes out all channels not on record remain in sync. At this time, the play amp output of those channels actually recording is derived from the play head, while the monitor output from channels switched to PB (playback) is still derived from the record head. Sync is useful for punch-in recording (overdubbing).



(PRESET) This button activates the two presettable functions of the machine. These functions are Record/Input and Record/Mute, and are described fully in section 1.1.2. PRE is always ON, except when the machine is in play mode; then PRE may be switched ON or OFF by pressing the PRE button. The button lights whenever PRE is on.

CAUTION: Do not operate the tape motion controls for more than 5 seconds without tape threaded on the transport. An exception is noted under LOAD, on the following page.



This button sets the tape supply reel for fast winding. It can be initiated from any mode. The button lights when rewinding.



This button sets the tape takeup reel for fast winding. It can be initiated from any mode. Button lights when winding.



This button sets the machine for play mode, moving the tape at the selected speed. The button lights when in play or record mode, and it must also be pressed simultaneously with the Record button to initiate Record Mode.



This button sets the machine for record mode, provided the PLAY button is simultaneously pressed. The button lights when recording.

In order for individual tracks to actually record, the corresponding Mode Selector must be switched to one of the three Record *READY* positions. Refer to section 1.1.2 for details of the Mode Selector function.



This button stops the machine from any mode.

CAUTION: When the end of the tape runs off a reel, the LOAD button must be pressed. Pressing STOP under these circumstances will not stop the reel motors.



Shuts off all reel motors and drops the tape lifters when the button is pressed. Button is lit when in load mode. LOAD allows manually controlled tape motion by defeating the constant tension servo mechanism responsible for automatic slack takeup. It is useful for threading

tape and for editing. The machine will leave load mode when STOP or any motion button is subsequently depressed.

LOAD may be pressed simultaneously with another motion control. For example, pressing PLAY and LOAD permits precise cueing (play/load mode), and pressing PLAY, RECORD and LOAD permits spot-erasure (record/load mode).

NOTE: When spot erasure is complete, press the *REWIND* or *FORWARD* button to drop out of record without "clicks."

LOAD may be used when tape is not threaded but it is necessary to use the motion controls for alignment or check-out. Some motion may begin, but slight hand pressure on the reels will hold the tape stationary. A specific application of this function is to find out whether or not the machine is in PRE when switched to play mode; the desired PRE status may be selected without actually advancing the tape.

CAUTION: NEVER DEPRESS LOAD WITH A REEL OF TAPE THREADED AND MOVING. This removes the tape tension, and can cause uncontrolled spillage. LOAD should only be pressed when the reels are still, or when approaching 15' from the end of the tape.

1.1.2 SYNC PANEL Ready and Record indicators, a VU meter and a Mode Selector switch are mounted on the Sync Panel, one set per channel. The actual functions performed by these indicators and switches are somewhat complex, and are treated in greater detail elsewhere in section one. Below are listed brief descriptions of each item on the front of the Sync Panel.

| ITEM | DESCRIPTION |
|------|-------------|
|------|-------------|

| | |
|-----------------|--|
| VU METER | This reads the average signal level of the channel, either from the line input or the play amplifier output: the play amplifier derives its signal from either the record or the play head, depending upon the logic and switch functions (described elsewhere in section one). The meter is factory calibrated for 0 VU=+4 dBm (into 600 ohms). |
|-----------------|--|

| | |
|-------------------------------------|--|
| READY Indicator (amber lens) | This lamp lights when the channel's Mode Selector switch is in any of the three Record positions, but the transport is not in record mode. The light is a signal that the channel will record as soon as the machine is placed in record mode. |
|-------------------------------------|--|

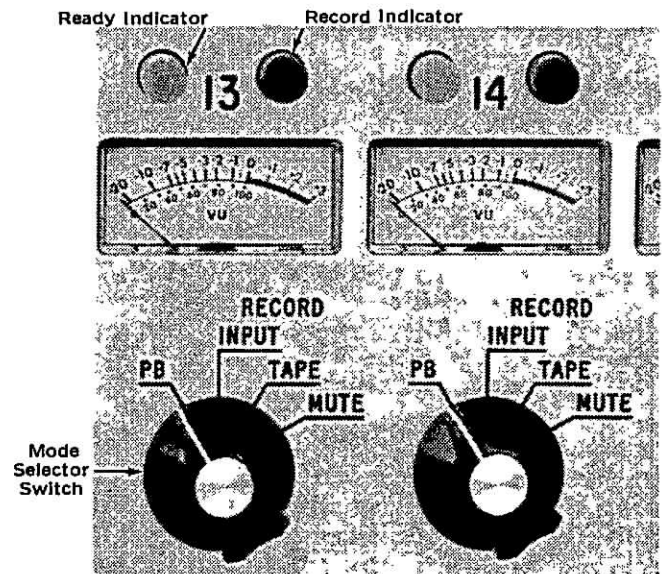
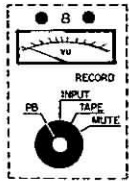


Figure 1-2. Sync Panel Controls & Indicators

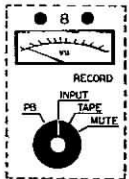
| | |
|------------------------------------|--|
| RECORD Indicator (red lens) | This lamp lights when the channel's Mode Selector switch is in any of the three Record positions and the transport is in record mode. The light is a warning that the channel is actually recording. |
|------------------------------------|--|

MODE SELECTOR

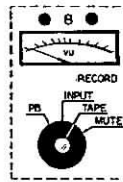
This switch determines the status of the record and playback electronics for the corresponding channel. There are four modes:



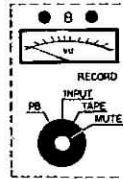
PB (Playback) This is the *SAFE* position from which the track cannot be erased or recorded. The channel output is derived from either the play or the record head, depending upon the sync status. The VU meter follows the channel output, whether derived from the record or play head.



RECORD/INPUT This is a *READY* mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is derived from the line input whenever PRE is lit, and from the play amplifier when PRE is off: the play amplifier signal is derived from the play head or record head, depending upon the sync status.



RECORD/TAPE This is a *READY* mode from which the track may be recorded. The VU meter and the channel output both follow the play amplifier output. The play amplifier output will always be from the play head unless the machine is in play/sync mode; then the output will be derived from the record head.



RECORD/MUTE This is a *READY* mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is muted (no output) whenever PRE is lit. Therefore, the only time when there is channel output is in play mode with PRE off. This output will be derived from the record head, or the play head, depending on the SYNC status.

1.2 PRE-OPERATING PROCEDURE

1.2.1 APPLY POWER Press the POWER button. This illuminates both the button and the VU meters, and prepares the machine for operation.

1.2.2 SELECT TAPE SPEED The tape speed is determined in three ways. Each speed selector described below will override the previous one.



Select the desired play or record speed with this button. The speed is 30ips when the button is lit, and 15ips unlit. Electronic record/play equalization is automatically switched to conform to the selected tape speed.



Selecting Scan speed (button lit) will advance the tape at 60ips in play or record modes. The equalization is not affected by the SCAN button.

The variable speed oscillator has a Locked/Variable speed switch. This switch does not affect the equalization. In Locked position (toggle switch up), the transport will play or record at the previously selected 15ips, 30ips or Scan speed. In Variable position (toggle switch down), the vernier dial may be adjusted to continuously vary the tape speed, to deviate $\pm 33\%$ from the selected speed.

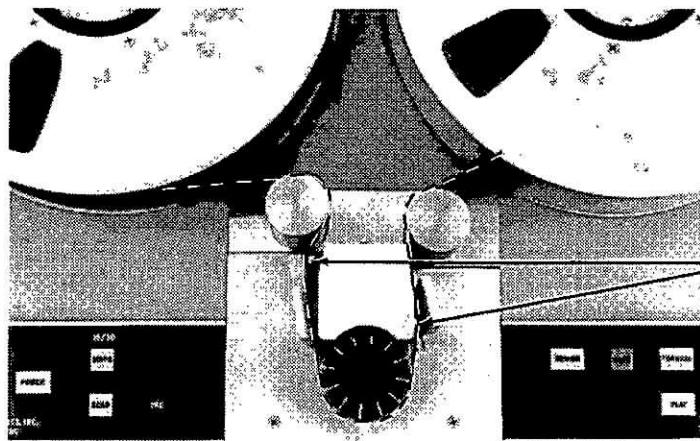


Figure 1-3.
Tape Threading Path

NOTE: Tape is routed outside lifters.

1.2.3 THREAD TAPE Only reels with NAB hubs, 4½" diameter (11.4cm) may be used. The supply and takeup reel sizes may be mixed since the transport servo mechanism automatically adjusts the motors to obtain the proper tape tension.

To facilitate threading, apply power and press the LOAD

button. This eliminates the braking force and also prevents runaway motion of the reels. Thread the tape as illustrated in figure 1-3, anchoring the end to the hub of the takeup reel. Hand-turn the takeup reel to remove most of the slack, and press the STOP button; STOP removes the machine from load mode and fully tensions the tape.

1.3 PLAYBACK

- Step 1** Set the Mode Selector of each channel to PB.
- Step 2** Apply power, select the desired speed, and thread the tape as described in section 1.2. Amber *READY* lights should not be lit.

- Step 3** Press the *PLAY* button to initiate playback. The channel outputs and VU levels will be derived from the play head. The audio quality from *SYNC* is the same as normal play mode.

- Step 4** Press the *STOP* button to end playback and stop tape motion.

NOTE: *If tape runs completely off the reel, press LOAD. Do not press STOP.*

1.4 FAST WINDING

1.4.1 FORWARD WINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the *FORWARD* button to initiate fast winding onto the takeup reel. This may be initiated from any mode.
- Step 3** Press the *STOP* button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the *LOAD* button.

1.4.2 REWINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the *REWIND* button to initiate fast winding onto the supply reel. This may be initiated from any mode.
- Step 3** Press the *STOP* button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the *LOAD* button.

1.5 RECORDING

NOTE: *Always bulk-erase any tape which was recorded on equipment with a different head configuration. This assures complete erasure.*

1.5.1 WITHOUT SYNC

- Step 1** Tape should be threaded with power ON, as described in section 1.2.
- Step 2** Set the Mode Selector switch for each channel. Channels to be recorded should be set to *RECORD/INPUT*, and the *READY* light will turn on. Channels not to be recorded should be set to *PB*.
- Step 3** Apply a test signal or sample program material to the input of all channels to be recorded. Adjust the input levels so that the corresponding VU meters indicate no more than 0 VU for most peaks.* Extreme peaks may indicate +2 or +3.
- Step 4** When ready to record, press the *PLAY* button and hold it down while pressing the *RECORD* button. All channels that were in *READY* will now record; the amber lights will turn off and the red lights will turn on.

NOTE: *The VU readings and audio output of the channel(s) recording are now derived from the line input. For*

monitoring the actual recorded signal, set the Mode Selector(s) to Record/Tape; the VU reading(s) and channel output(s) will now be derived from the play head.

- Step 5** Press the *STOP* button to end recording and stop the tape motion, unless the tape has run completely off the supply reel; in that case, press *LOAD*.

1.5.2 WITH SYNC The Sync feature allows recordings to be made in synchronization with previously recorded program material. In order to achieve the correct timing, all channel outputs are derived from the record head while the machine is in *PLAY/SYNC* mode. As soon as the *RECORD* button is pressed, placing the machine in *RECORD/SYNC* mode, the input to channels in *RECORD* replaces the record head output. For channels in *PB*, the record head output continues to feed the channel output, so that a performer or engineer may monitor the new recording in synchronization with the existing tracks.

- Step 1** With power ON, thread tape on the transport, as described in section 1.2.
- Step 2** Set the Mode Selector for each channel; channels to be recorded should be set to *RECORD/INPUT*. Previously recorded or unused channels should be protected by setting the Mode Selector to *PB*.

* 0 VU is factory calibrated to a level of +4 dBm.

Step 3 Depress the SYNC button. It should light, indicating the machine is ready to play and record in sync.

Step 4 Apply a test signal or sample program material to the input of those channels to be recorded. Adjust the input levels so that the corresponding VU meters show peaks of no more than 0 VU. Extreme peaks may indicate +2 or +3 VU.

NOTE: *During synchronized recording, some performers prefer to have their channel(s) muted. If the Mode Selector is placed in RECORD/MUTE, then the desired effect will be achieved; the channel will have no audio output while recording. The output during PLAY will be muted if PRE is lit, or will be derived from the record head if PRE is off.*

Step 5 Press the PLAY button. The output of all previously recorded channels may now be monitored, and at the instant recording is to begin, the PLAY and RECORD buttons may be depressed.

Step 6 By switching the Mode Selectors to RECORD/TAPE, the quality of the recorded signal may be monitored. This mode of monitoring is generally preferred, so long as the output from the channels is not fed to the performer; since there is a time delay, such monitoring could be disconcerting.

Step 7 Press the STOP button to end recording and halt the tape motion, unless the tape has run completely off the supply reel. In that case, press LOAD.

1.6 EDITING

The two edit modes available are PLAY/LOAD and PLAY/SCAN. The PLAY/LOAD mode should be entered only from STOP mode. It is used to precisely locate cues. IN PLAY/LOAD, the reel motors do not maintain tape tension, so the tape may be manually controlled. This also makes splicing easy, since slack is not automatically taken up. To leave PLAY/LOAD mode, press STOP or any other motion button.

PLAY/SCAN is helpful for rough location of program cues. Pressing the SCAN button sets the transport for a 60ips speed, although equalization remains at the 15ips or 30ips setting previously selected. When PLAY is then pressed, the machine will play at 60ips. SCAN may be punched in and out during the playback of a tape. To leave SCAN mode, press the SCAN button a second time.

NOTE: *RECORD/SCAN mode may be used, and recording will occur at the rate of 60ips. But equalization remains optimized for 15ips or 30ips. RECORD/LOAD mode may be used to achieve spot erasures, but care must be taken to assure that the erase head, not the record head, is aligned with the point where erasure is to begin. Press REWIND or FORWARD when erasure is complete to eliminate punch-out "clicks."*

SECTION TWO
ELECTRONIC ALIGNMENT AND
TAPE HANDLING ADJUSTMENT

2.1 ELECTRONIC ALIGNMENT

The record and playback electronics are aligned in a manner similar to other professional tape machines. The equalization curves fall within NAB specifications, although there is some deviation from the idealized NAB curve which enables Stephens' machines to record low frequencies at greater levels before reaching tape saturation. Nevertheless, standard NAB alignment tapes are used in the following procedures.

Stephens' heads are factory calibrated to the proper azimuth, zenith and meridian. Because the heads and transport top plates are precision machined, no further mechanical alignment is necessary.

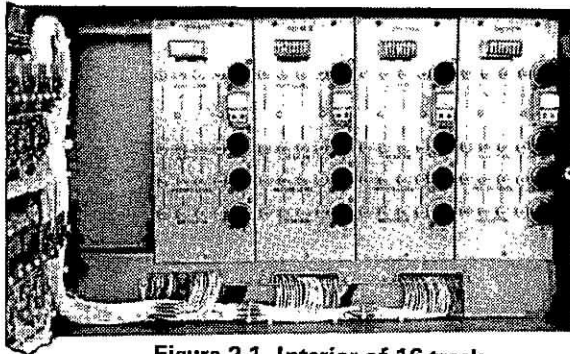


Figure 2-1. Interior of 16-track Sync Panel showing 811D-4000 Modules

2.1.1 PLAY LEVEL & EQUALIZATION

Step 1 Degauss the heads in accordance with standard procedures. This is a conventional method for removing any residual magnetism from the heads, magnetism which may otherwise degrade the high frequencies on delicate alignment tapes, interfering with proper level calibration.

Step 2 Turn power ON and press LOAD. Thread a standard NAB alignment tape for the appropriate speed on the transport. A Full-Track alignment tape is preferable.

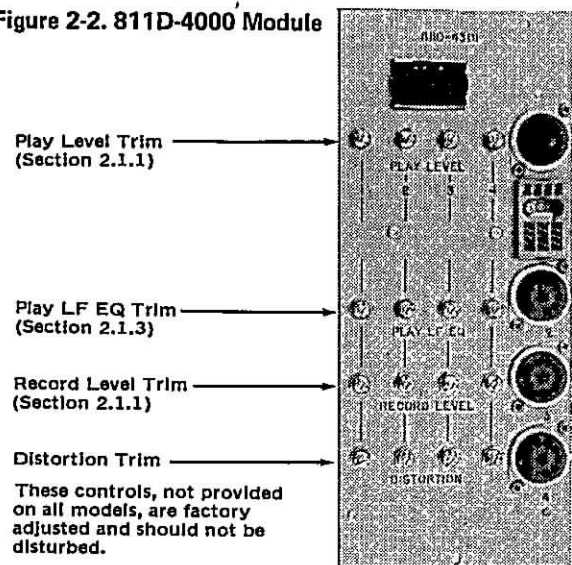
NOTE: It is generally desirable to store alignment tapes with the tail end out. Therefore, the tape will be threaded from the right to the left, and rewound. This procedure assures evenly wound tape.

Step 3 Set the transport speed to correspond with the alignment tape, 15ips or 30ips.

Step 4 Set all sync panel Model Selectors to PB.

Step 5 Undo the latch on the sync panel, and swing the panel open, revealing the 811D-4300 series modules. Refer to figure 2-1.

Figure 2-2. 811D-4000 Module



Step 6 Press the PLAY button, and locate a 0 VU reference on the tape, preferably at 1000Hz.

Step 7 Adjust the PLAY LEVEL of each channel (the trimmer on the top row of the 4300 module) so the corresponding VU meter indicates 0 dB. Refer to figure 2-2.

Step 8 Press the STOP button.

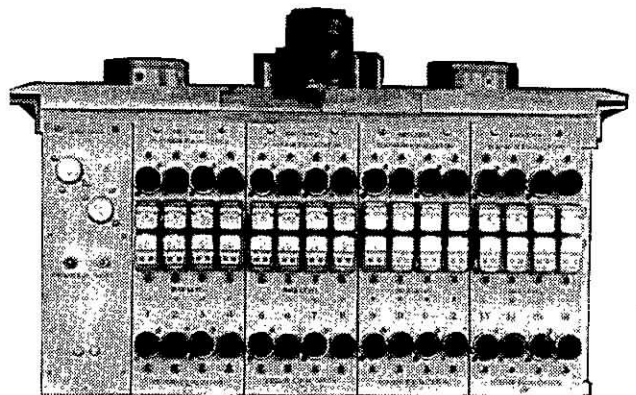
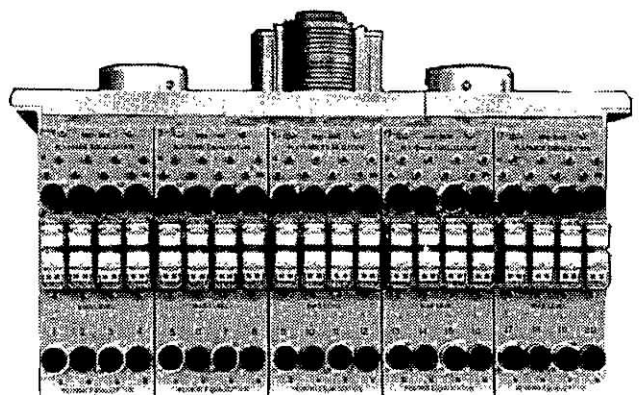


Figure 2-3. Front of Model 103 Transport 16-track (above) and 24-track (below)



- Step 9** Locate the 811D-3000 series modules at the front edge of the transport; cabinets have a door which swings down for access to these modules when the pair of buttons at the upper corners are depressed.

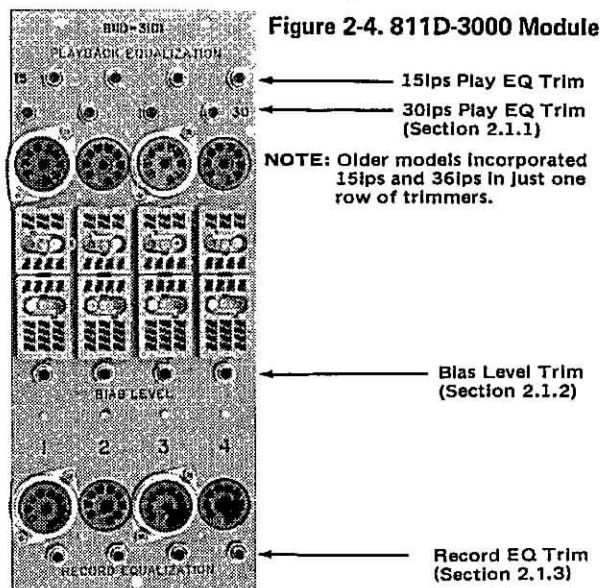


Figure 2-4. 811D-3000 Module

- Step 10** Place the machine in PLAY mode, and locate the 0 VU, 15 kHz reference on the tape.
- Step 11** Adjust each channel's PLAYBACK EQUALIZATION (trimmers located on the 811D-3000 series modules), so the corresponding VU meter indicates 0 dB. (Refer to fig. 2-4.)

NOTE: Adjust the trimmers corresponding to the tape speed; top row for 15ips and lower row for 30ips. Early models are equipped with just one set of trimmers, used for either play speed.

- Step 12** Press FORWARD, and wind the alignment tape to the end; then press LOAD and remove the tape from the transport.

This completes the playback alignment. All controls may be left as they are, with the 811D-3000 modules exposed, in preparation for the following procedures.

2.1.2 BIAS LEVEL & RECORD LEVEL The front of the transport should be exposed, as described in 2.1.1, step 9. Power is ON.

- Step 1** Thread a blank tape on the transport (section 1.2.3).
- Step 2** Set all Mode Selectors to RECORD/TAPE.
- NOTE:** The procedures outlined in steps 3-7 are to be performed for each channel in succession.
- Step 3** Apply a 1000 Hz, +4 dBm sine wave to input.
- Step 4** Adjust the RECORD LEVEL trimmer (in the sync panel, see figure 2-2) to approximately mid rotation.

- Step 5** Press PLAY and RECORD, placing the machine in record mode.
- Step 6** Set the BIAS LEVEL trimmer (on the 811D-3000 module, see figure 2-4) by turning it clockwise until the corresponding VU meter reaches a peak, then continue to turn clockwise until the level drops 1/4 to 1/8 dB below the peak.
- Step 7** Readjust the RECORD LEVEL trimmer so that the VU meter indicates 0 dB.
- Step 8** Press STOP. This completes the record and bias level adjustments.

2.1.3 BIAS FREQUENCY & SYMMETRY

Trimmers for bias frequency and symmetry are located on the bias module, and are set at the factory for optimum performance. While the bias frequency does not affect the quality of the recorded signal, it does affect the efficiency of conversion of the electrical signal to the magnetic flux. The frequency is therefore factory set for maximum efficiency with the largest number of tracks in RECORD mode. The symmetry control, labeled NOISE, affects the waveform of the bias, and consequently the noise level of the unmodulated, recorded tape. The noise setting is not critical; however, if the optimum noise characteristic is desired, bias symmetry may be adjusted as follows:

- Step 1** The transport should be oriented so that the bias module is accessible. On machines of up to 16 tracks, the bias module is mounted on the front of the transport. 24 track or larger machines may have twin bias modules beneath the transport; one module is slaved to the other, so only one set of frequency & symmetry trimmers is provided.
- Step 2** Thread a blank tape on the transport (section 1.2.3), with power ON.

- Step 3** To arrive at the optimum symmetry setting, first determine the number of tracks which are simultaneously placed in RECORD MODE. For example, a 24 track machine may be operated with just 8 tracks in record mode at any given time. Set this number of tracks in RECORD/TAPE position with the sync panel mode selector. The resulting load on the bias circuit is slight but it will enable the most accurate setting of the symmetry (noise) control.

- Step 4** Monitor the output of any one of those tracks placed in RECORD; then place the transport in RECORD MODE by pressing the PLAY and RECORD buttons simultaneously.

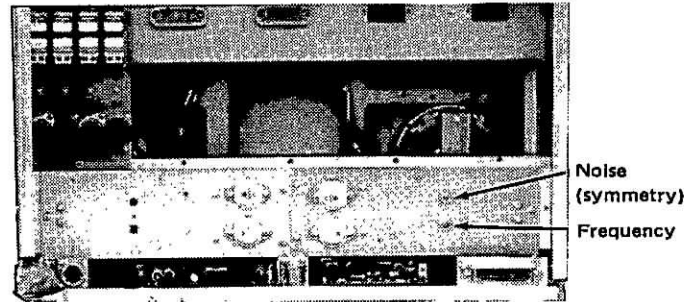


Figure 2-5. Bias Modules Beneath 24/40 Track Transport

- Step 5** Adjust the NOISE trimmer for the minimum noise on the track being monitored (monitoring can be done with a voltmeter or by ear).

- Step 6** Press STOP. This completes the symmetry adjustment.

2.1.4 RECORD EQ The 811D-3000 modules should be accessible, as described in section 2.1.1, step 9. A test oscillator should be available for connection to the input of each channel (or by means of input assignment through the mixing console).

- Step 1** Turn the power ON, and thread a blank tape on the transport.
- Step 2** Set all sync panel Mode Selectors to RECORD/TAPE.
- Step 3** Press the PLAY and RECORD buttons, placing the machine in record mode.

NOTE: The procedures outlined in steps 4-7 are to be performed for each channel in succession.

- Step 4** Apply a 15 kHz, +4 dBm sine wave to the input.
- Step 5** Adjust the RECORD EQUALIZATION (trimmer located on the 811D-

3000 module, see figure 2-4) so the corresponding VU meter indicates 0 dB.

NOTE: Steps 6 and 7 are required only for 15ips alignment. For 30ips alignment, proceed with step 8.

- Step 6** Change the input signal to a +4 dBm sine wave of between 35 and 40 Hz.

- Step 7** Adjust the PLAY LF EQ (trimmer in the sync panel, see figure 2-2) so the corresponding VU meter indicates 0 dB.

- Step 8** Press REWIND and when the tape runs off the takeup reel, press LOAD. This completes the recording equalization adjustments.

NOTE: It is considered a safe practice to reset all Mode Selectors to PB, unless recording is to be done immediately following the alignment procedure.

2.2 TAPE MOTION ADJUSTMENTS

The Stephens' transport is designed for gentle tape handling without need for mechanical adjustments. The servo-operated supply and takeup motors are controlled by circuitry which compares the actual tape motion with the desired motion. This is done by means of a tachometer and a discrimination circuit which integrates the measured tape speed with motion sensing inputs from each motor and with a synchronization signal from an internal clock or an external oscillator/resolver. Therefore, the only adjustments required are electrical in nature.

2.2.1 TAPE TENSION ADJUSTMENT

The following adjustment requires a voltmeter capable of accurately indicating 10 volts dc. The bottom of the transport must be accessible (see section 2.1.1, step 9).

- Step 1** Connect a voltmeter across the 5-ohm resistor on the power supply. The meter should be set to the 10 Vdc scale (or higher), with the leads connected as shown in figure 2-6.

- Step 2** Apply power to the transport and thread a reel of tape.

- Step 3** Press the PLAY button, placing the transport in motion at 15ips or 30ips.

- Step 4** Locate the tension trimmer on the SERVO CONTROL BOARD beneath the transport and adjust it for a reading of 10 volts across the power resistor (for 2" tape, 1" tape requires 7 volts). See figure 2-7.

- Step 5** Press the STOP button, and disconnect the voltmeter leads from the power resistor. This completes the tension adjustment.

Connect Voltmeter across
this resistor
Twisted lead (+)
Gray lead (-)

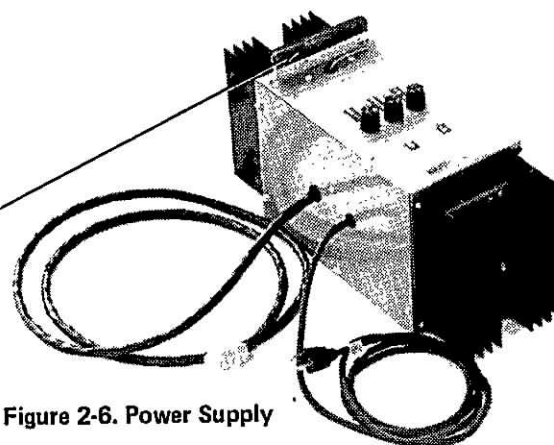


Figure 2-6. Power Supply

2.2.2 SLACK ADJUSTMENT The bottom of the transport must be accessible (see section 1.1.1, step 9).

- Step 1** With no tape threaded on the transport, turn the power ON and press the STOP button.
- Step 2** Locate the SLACK control on the SERVO CONTROL BOARD (refer to figure 2-7).
- Step 3** Adjust the SLACK trimmer in a clockwise direction until the supply motor does not move.
- Step 4** Then rotate the trimmer counterclockwise until the motor just begins to move; it may alternately start and stop. This is the correct setting for the SLACK trimmer.
- Step 5** Turn off the power. The adjustment is complete.

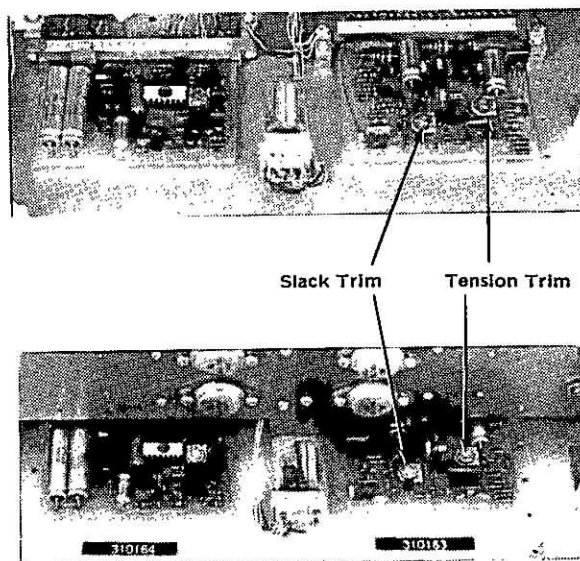


Figure 2-7. Servo and Resolver Boards
4 - 16-track (above) and 24 - 40-track (below)

2.2.3 SPEED ADJUSTMENT The fixed running speed of the transport may be precisely calibrated to 15ips, 30ips and 60ips by means of three independent trimmers. These trimmers are adjusted using the meter in the remote VSO unit. Three tachometer-triggered counter outputs in the transport provide approximately 60 Hz pulses for 15ips, 30ips and 60ips running speeds. When a given tape speed is precisely adjusted, the counter output will be exactly 60 Hz, corresponding to the sync signal. The sync signal is derived from the power mains or from an optional crystal/resolver input. At exact speed, the VSO meter will settle at mid-scale, rather than follow the beat of the out-of-phase signals.

The following adjustment may be done for one, two or all three tape speeds; speed trimmers for 15, 30 and 60ips are recessed beneath a cover plate, near the power button.

- Step 1** Turn the power ON, and thread a reel of tape.
- Step 2** Place the transport in PLAY mode, with the desired speed selected (i.e. 15ips, 30ips or SCAN).

- Step 3** Observe the VSO meter, with the VSO switched to fixed speed mode.

NOTE: The VSO meter should stabilize near mid-scale as the tape reaches full running speed. If there is a large rhythmic motion of the needle, then the speed must be adjusted. If the meter has a slight motion, but is near mid-scale, then adjustment is not necessary.

- Step 4** Remove the cover plate surrounding the POWER, PRE SCAN, SYNC and 30ips buttons. This may be done by inserting a screwdriver blade between the cabinet and the transport and prying up the cover.
- Step 5** Insert a screwdriver in the trimmer which corresponds to the speed selected. Adjust the trimmer gradually until the meter needle comes to rest at

mid-scale (see fig. 2-8). Due to temperature sensitivity, some upscale drift occurs if this adjustment is made when the machine has just been turned on. Therefore, it may be desirable to set the meter for a reading below mid-scale, allowing for the drift. Since the important factor is the stabilization of the needle, rather than the actual value on the scale, any stable setting from 0.3 to 0.7 is acceptable. The meter indicates phase lock rather than actual speed.

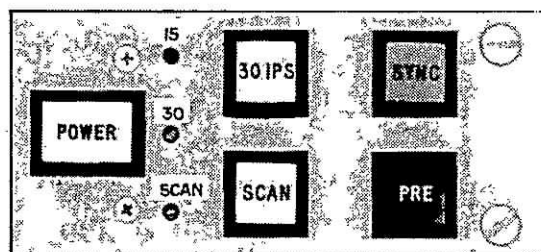


Figure 2-8. Speed Trimmers

- Step 6** Press STOP. If other speed calibration is required, repeat steps 2, 3 and 5 before replacing the cover plate.
- Step 7** Turn the power OFF and replace the cover plate.
-

3.1 GENERAL

The installation procedure for all Stephens Electronics tape machines is very straightforward. The power supply, sync panel and VSO package join the transport by means of three or four factory-wired connectors. All audio input and output, as well as remote control circuits for Dolby or equivalent type noise reduction units, must be wired to from one to four connectors which then plug into the sync panel.* Finally, the power supply plugs into a suitable 115VAC/60Hz main, and the machine is ready to operate.

The following paragraphs describe each step in full detail, including the essential connector locations, wiring diagrams, and wire termination information.

3.2 POWER SUPPLY

3.2.1 LOCATION The power supply may be located nearly anywhere, provided the interconnecting cable is long enough to reach the underside of the transport. The bottom of the floor-standing cabinet is an ideal location. In other locations, allow adequate space for convection cooling.

3.2.2 FUNCTION The power supply provides the machine with three DC voltages for audio and logic circuitry; *all DC voltages are wired for positive ground.* There are regulated -27V and unregulated -37V referenced to one ground (common), with a separate -62V output and ground.

The forementioned outputs are wired to the power supply connector with dual leads for added power handling capability and protection against breakage. A 17VAC output provides 60Hz reference for the phase comparator circuit. This circuit determines the transport speed. Other leads in the power supply cable include: the 115VAC input to the transformers, switched by the POWER button on the transport, and the circuitry for both motor drive transistors (located in the power supply).

3.2.3 CONNECTION The power cable mates with a connector on the rear flange of the chassis, beneath the transport. The chassis connector (JA), Amphenol No. 222-22N31, is keyed to assure correct insertion.

CAUTION: Prior to inserting the 115VAC plug in the power outlet, make certain the outlet does carry the correct voltage (at 60Hz). For 50Hz line frequencies, a special adapter must be used (consult your dealer or contact Stephens Electronics).

*The 24-track, Model 821-C electronics have remote switching capability for each channel in the sync panel, ie; PB, REC-INPUT, REC-TAPE or REC-MUTE. In addition to the two I/O connectors and the two transport harness connectors on that sync panel, a fifth connector is provided for the optional switching unit (J25).

3.3 VSO

3.3.1 LOCATION The VSO package is intended for operation either at the tape machine or remotely. A convenient location is on top of the sync panel. The position locator option, when ordered, is housed in the VSO package.

3.3.2 FUNCTION The VSO serves two purposes. It can be used to vary the speed of the transport $\pm 33\%$ from the selected speed. In other words: at 15ips, the VSO permits speeds from 10ips to 20 ips; at 30ips, the VSO permits speeds from 20ips to 40ips; at SCAN (60ips), the VSO permits speeds from 40ips to 80ips. The toggle switch on the VSO selects the fixed transport speed (switch up) or the variable speed (switch down), and a vernier dial with a digital logging scale permits precise adjustment in variable speed mode.

The second function of the VSO is described in section two of this manual. The meter can be used to calibrate the fixed speeds. Since the meter displays phase, it is not used to indicate the actual running speed of the transport.

3.3.3 CONNECTION The VSO cable mates with a connector on the rear flange of the chassis, beneath the transport. The chassis connector (JH), Amphenol No. 57-40360, is keyed to assure correct insertion.

NOTE: *The VSO must be connected in order for the machine to operate properly, even though fixed speed operation is desired.*

3.4 SYNC PANEL—TRANSPORT HARNESS

3.4.1 LOCATION A wiring harness emerges from the rear of the transport. Four track to sixteen track machines have just one connector at the end of this harness (J5), whereas larger machines have two connectors (J5 and J6).

3.4.2 FUNCTION This harness provides DC power for the lamps and amplifiers in the sync panel. Additionally, it provides status information on the SYNC and PRE functions, and audio interconnection between the sync panel and the transport-mounted audio circuits. J5 accommodates channel 1 through channel 20, and J6 carries the rest of the channels.

3.4.3 CONNECTION Each harness connector mates with a green Amphenol connector, No. 220-1N104, on the rear of the sync panel. Refer to the diagrams in section 3.5 for identification of J5 and J6.

3.5 SYNC PANEL—STUDIO INTERFACE (I/O CONNECTIONS)

3.5.1 FUNCTION Based on the total number of channels, either one, two or four plugs carry the audio input and output between the tape machine and the studio. The same connectors (J20 through J23) also carry -24V control signals (positive ground) for remote switching of Dolby or equivalent noise reduction equipment. Most customers prefer to wire the I/O connectors at or just prior to the installation of the tape machine.

However, Stephens Electronics will provide custom harnesses as an option. Such harnesses must be ordered at least 30 days prior to delivery, and orders must include full details of connector type, lead dress, and so forth.

3.5.2 CONNECTION The following diagrams illustrate the connector locations and channel allocations for each sync panel, from 4-track to 40-track. Accompanying lists show the specific pin assignments. Note that the assignments vary, depending on the size of the machine. All audio circuits are unbalanced. Connectors are Amphenol No. 57-30500.

In 8-track or larger machines, all input and output grounds are bussed together (except the 24V common). Thin bus bar should be used to accomplish these connections, and the bar should clear the connector pins by approx. 1/8". Twin-conductor shielded cable is recommended for audio leads, with the low conductor and shield joined together at both ends of the cable. The low and shield can be soldered to the bus bar on the I/O connector.

The noise reduction/remote control circuits, if used, should be wired with shielded multi-conductor cable. While the shield is not absolutely necessary, it will reduce the possibility of noise from switching transients during SYNC recording.

4-TRACK

| PIN NO. | CONNECTION | CONNECTOR NO. J20 |
|---------|--------------------|----------------------|
| 1 | NOT USED | |
| 2 | " | |
| 3 | " | |
| 4 | " | |
| 5 | " | |
| 6 | " | |
| 7 | " | |
| 8 | " | |
| 9 | " | |
| 10 | Record Input, GND | 1 |
| 11 | " | 2 |
| 12 | " | 3 |
| 13 | " | 4 |
| 14 | NOT USED | |
| 15 | " | |
| 16 | " | |
| 17 | " | |
| 18 | Playback Out, GND | 1 |
| 19 | " | 2 |
| 20 | " | 3 |
| 21 | " | 4 |
| 22 | NOT USED | |
| 23 | " | |
| 24 | " | |
| 25 | " | |
| 26 | Dolby Control, 24V | 1 |
| 27 | " | 2 |
| 28 | " | 3 |
| 29 | " | 4 |
| 30 | NOT USED | |
| 31 | " | |
| 32 | " | |
| 33 | " | |
| 34 | Dolby Control, Com | |
| 35 | Record Input, High | 1 |
| 36 | " | 2 |
| 37 | " | 3 |
| 38 | " | 4 |
| 39 | NOT USED | |
| 40 | " | |
| 41 | " | |
| 42 | " | |
| 43 | Playback Out, High | 1 |
| 44 | " | 2 |
| 45 | " | 3 |
| 46 | " | 4 |
| 47 | NOT USED | |
| 48 | " | |
| 49 | " | |
| 50 | " | |

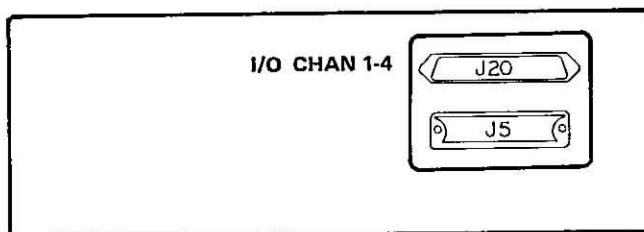


Figure 3-1. 4-Track Sync Panel, Rear Connectors

8-TRACK

| PIN NO. | CONNECTION | CONNECTOR NO. J20 |
|---------|--------------------|----------------------|
| 1 | NOT USED | |
| 2 | " | |
| 3 | " | |
| 4 | " | |
| 5 | " | |
| 6 | " | |
| 7 | " | |
| 8 | " | |
| 9 | " | |
| 10 | Record Input, GND | 1 |
| 11 | " | 2 |
| 12 | " | 3 |
| 13 | " | 4 |
| 14 | " | 5 |
| 15 | " | 6 |
| 16 | " | 7 |
| 17 | " | 8 |
| 18 | Playback Out, GND | 1 |
| 19 | " | 2 |
| 20 | " | 3 |
| 21 | " | 4 |
| 22 | " | 5 |
| 23 | " | 6 |
| 24 | " | 7 |
| 25 | " | 8 |
| 26 | Dolby Control, 24V | 1 |
| 27 | " | 2 |
| 28 | " | 3 |
| 29 | " | 4 |
| 30 | " | 5 |
| 31 | " | 6 |
| 32 | " | 7 |
| 33 | " | 8 |
| 34 | Dolby Control, Com | |
| 35 | Record Input, High | 1 |
| 36 | " | 2 |
| 37 | " | 3 |
| 38 | " | 4 |
| 39 | " | 5 |
| 40 | " | 6 |
| 41 | " | 7 |
| 42 | " | 8 |
| 43 | Playback Out, High | 1 |
| 44 | " | 2 |
| 45 | " | 3 |
| 46 | " | 4 |
| 47 | " | 5 |
| 48 | " | 6 |
| 49 | " | 7 |
| 50 | " | 8 |

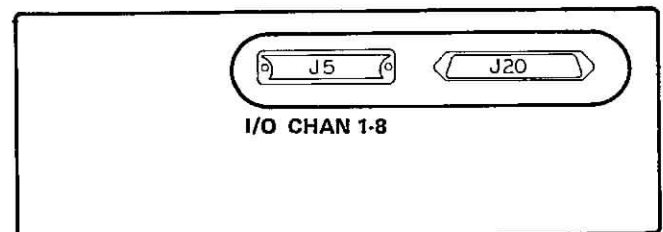
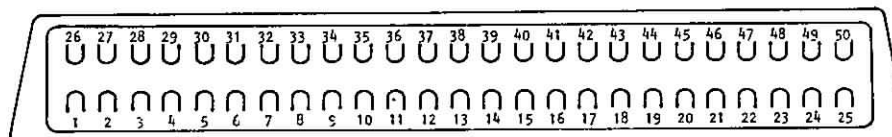
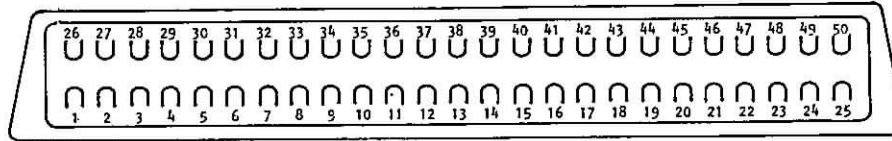


Figure 3-2. 8-Track Sync Panel, Rear Connectors



I/O CONNECTOR WIRING SIDE



I/O CONNECTOR WIRING SIDE

16-TRACK
Audio Connector Wiring

| PIN NO. | CONNECTION | CONNECTOR NO. | | PIN NO. | CONNECTION | CONNECTOR NO. | |
|---------|----------------|---------------|-----|---------|--------------------|---------------|-----|
| | | J20 | J21 | | | J20 | J21 |
| 1 | NOT USED | | | 26 | Dolby Control, 24V | 1 | 9 |
| 2 | " | | | 27 | " | 2 | 10 |
| 3 | " | | | 28 | " | 3 | 11 |
| 4 | " | | | 29 | " | 4 | 12 |
| 5 | " | | | 30 | " | 5 | 13 |
| 6 | " | | | 31 | " | 6 | 14 |
| 7 | " | | | 32 | " | 7 | 15 |
| 8 | " | | | 33 | " | 8 | 16 |
| 9 | " | | | 34 | Dolby Control, COM | | |
| 10 | REC & PB, GNDS | | | 35 | Record Input, High | 1 | 9 |
| 11 | " | | | 36 | " | 2 | 10 |
| 12 | " | | | 37 | " | 3 | 11 |
| 13 | " | | | 38 | " | 4 | 12 |
| 14 | " | | | 39 | " | 5 | 13 |
| 15 | " | | | 40 | " | 6 | 14 |
| 16 | " | | | 41 | " | 7 | 15 |
| 17 | " | | | 42 | " | 8 | 16 |
| 18 | " | | | 43 | Playback Out, High | 1 | 9 |
| 19 | " | | | 44 | " | 2 | 10 |
| 20 | " | | | 45 | " | 3 | 11 |
| 21 | " | | | 46 | " | 4 | 12 |
| 22 | " | | | 47 | " | 5 | 13 |
| 23 | " | | | 48 | " | 6 | 14 |
| 24 | " | | | 49 | " | 7 | 15 |
| 25 | " | | | 50 | " | 8 | 16 |

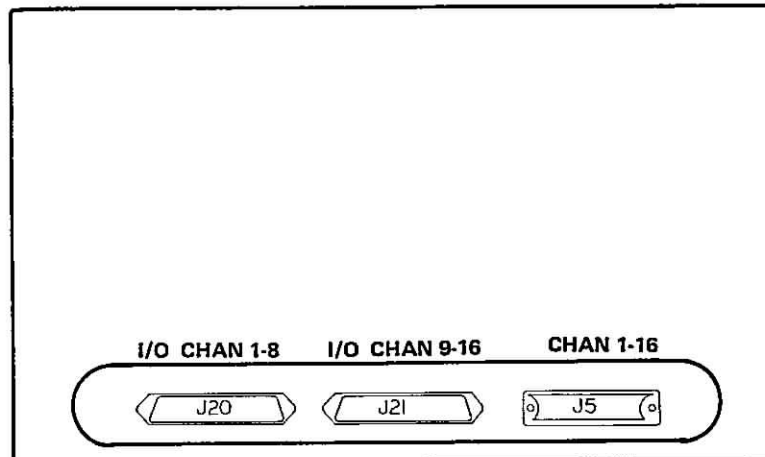
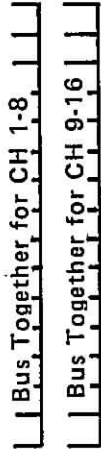
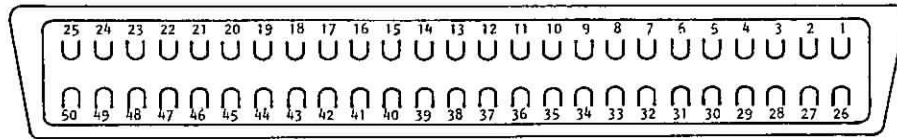


Figure 3-3. 16-Track Sync Panel, Rear Connectors

24-Track Sync Panel Audio Connector Wiring

page 3-5



I/O CONNECTOR WIRING SIDE

| PIN NO. | CONNECTION | CONNECTOR NO. | | PIN NO. | CONNECTION | CONNECTOR NO. | |
|---------|--------------------|---------------|-----|---------|-----------------------|---------------|-----|
| | | J20 | J21 | | | J20 | J21 |
| 1 | Playback Out, High | 1 | 13 | 26 | Dolby Control, 24V | 1 | 13 |
| 2 | " | 2 | 14 | 27 | " | 2 | 14 |
| 3 | " | 3 | 15 | 28 | " | 3 | 15 |
| 4 | " | 4 | 16 | 29 | " | 4 | 16 |
| 5 | " | 5 | 17 | 30 | " | 5 | 17 |
| 6 | " | 6 | 18 | 31 | " | 6 | 18 |
| 7 | " | 7 | 19 | 32 | " | 7 | 19 |
| 8 | " | 8 | 20 | 33 | " | 8 | 20 |
| 9 | " | 9 | 21 | 34 | " | 9 | 21 |
| 10 | " | 10 | 22 | 35 | " | 10 | 22 |
| 11 | " | 11 | 23 | 36 | " | 11 | 23 |
| 12 | Playback Out, High | 12 | 24 | 37 | Dolby Control, 24V | 12 | 24 |
| 13 | Record Input, High | 1 | 13 | 38 | Dolby Control, Common | | |
| 14 | " | 2 | 14 | 39 | REC & PB Grounds | B | |
| 15 | " | 3 | 15 | 40 | " | U | |
| 16 | " | 4 | 16 | 41 | " | S | |
| 17 | " | 5 | 17 | 42 | " | T | |
| 18 | " | 6 | 18 | 43 | " | O | |
| 19 | " | 7 | 19 | 44 | " | G | |
| 20 | " | 8 | 20 | 45 | " | E | |
| 21 | " | 9 | 21 | 46 | " | T | |
| 22 | " | 10 | 22 | 47 | " | H | |
| 23 | " | 11 | 23 | 48 | " | E | |
| 24 | Record Input, High | 12 | 24 | 49 | " | R | |
| 25 | NOT USED | | | 50 | REC & PB Grounds | | |

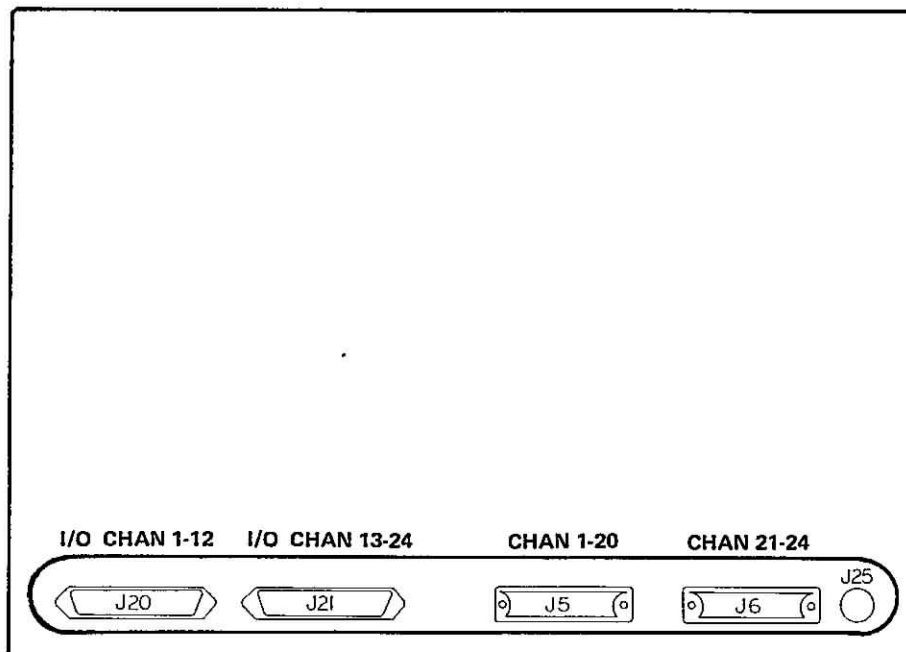
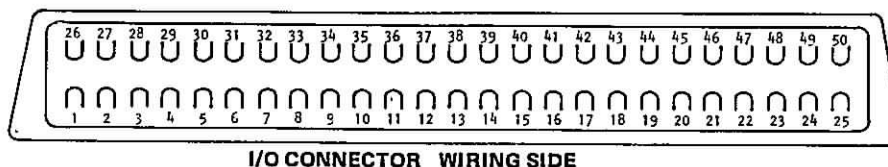


Figure 3-4. 24-Track Sync Panel, Rear Connectors

32-Track Sync Panel Audio Connector Wiring

page 3-6



| PIN NO. | CONNECTION | CONNECTOR NO. | | | | PIN NO. | CONNECTION | CONNECTOR NO. | | | |
|---------|---------------|---------------|-----|-----|-----|---------|-----------------------|---------------|-----|-----|-----|
| | | J20 | J21 | J22 | J23 | | | J20 | J21 | J22 | J23 |
| 1 | NOT USED | | | | | 26 | Dolby Control, 24V | 1 | 9 | 17 | 25 |
| 2 | " | | | | | 27 | " | 2 | 10 | 18 | 26 |
| 3 | " | | | | | 28 | " | 3 | 11 | 19 | 27 |
| 4 | " | | | | | 29 | " | 4 | 12 | 20 | 28 |
| 5 | " | | | | | 30 | " | 5 | 13 | 21 | 29 |
| 6 | " | | | | | 31 | " | 6 | 14 | 22 | 30 |
| 7 | " | | | | | 32 | " | 7 | 15 | 23 | 31 |
| 8 | " | | | | | 33 | Dolby Control, 24V | 8 | 16 | 24 | 32 |
| 9 | " | | | | | 34 | Dolby Control, Common | | | | |
| 10 | REC & PB GNDS | | | | | 35 | Record Input, High | 1 | 9 | 17 | 25 |
| 11 | " | B | | | | 36 | " | 2 | 10 | 18 | 26 |
| 12 | " | U | | | | 37 | " | 3 | 11 | 19 | 27 |
| 13 | " | S | | | | 38 | " | 4 | 12 | 20 | 28 |
| 14 | " | T | | | | 39 | " | 5 | 13 | 21 | 29 |
| 15 | " | O | | | | 40 | " | 6 | 14 | 22 | 30 |
| 16 | " | G | | | | 41 | " | 7 | 15 | 23 | 31 |
| 17 | " | E | | | | 42 | Record Input, High | 8 | 16 | 24 | 32 |
| 18 | " | T | | | | 43 | Playback Out, High | 1 | 9 | 17 | 25 |
| 19 | " | H | | | | 44 | " | 2 | 10 | 18 | 26 |
| 20 | " | E | | | | 45 | " | 3 | 11 | 19 | 27 |
| 21 | " | R | | | | 46 | " | 4 | 12 | 20 | 28 |
| 22 | " | | | | | 47 | " | 5 | 13 | 21 | 29 |
| 23 | " | 10 | | | | 48 | " | 6 | 14 | 22 | 30 |
| 24 | " | to | | | | 49 | " | 7 | 15 | 23 | 31 |
| 25 | " | 25 | | | | 50 | " | 8 | 16 | 24 | 32 |

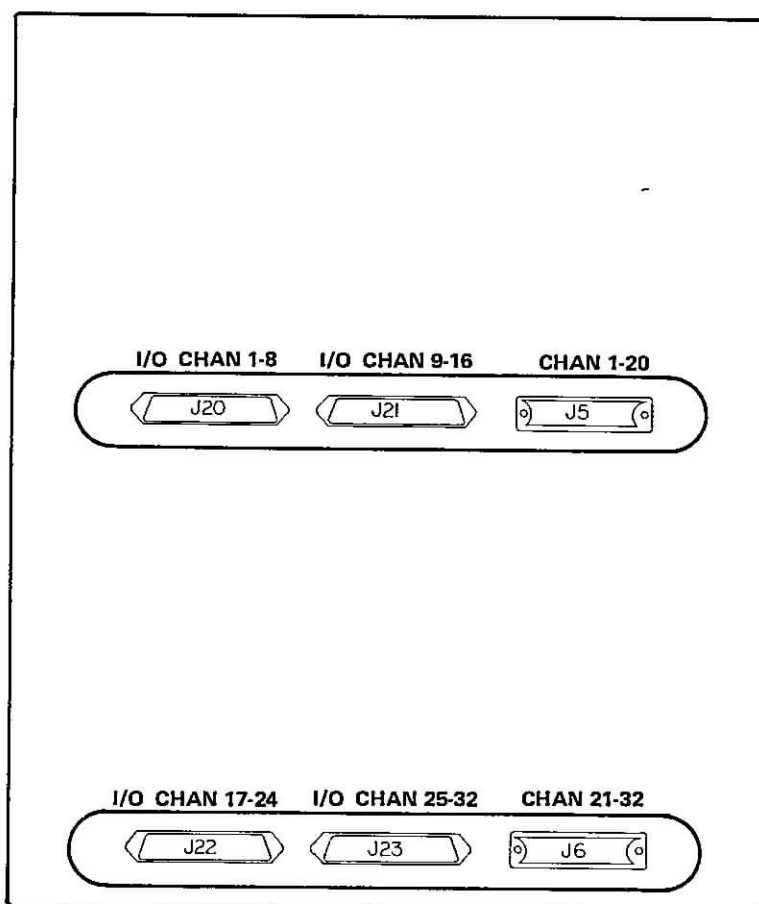
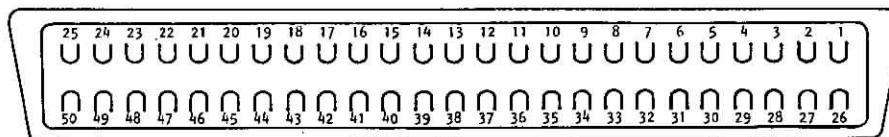


Figure 3-5. 32-Track Sync Panel, Rear Connectors



I/O CONNECTOR WIRING SIDE

| PIN NO. | CONNECTION | CONNECTOR NO. | | | | PIN NO. | CONNECTION | CONNECTOR NO. | | | |
|---------|--------------------|---------------|-----|-----|-----|---------|-----------------------|---------------|-----|-----|-----|
| | | J20 | J21 | J22 | J23 | | | J20 | J21 | J22 | J23 |
| 1 | Playback Out, High | 1 | 11 | 21 | 31 | 26 | REC & PB GNDS | B | | | |
| 2 | " | 2 | 12 | 22 | 32 | 27 | " | U | | | |
| 3 | " | 3 | 13 | 23 | 33 | 28 | " | S | | | |
| 4 | " | 4 | 14 | 24 | 34 | 29 | " | | | | |
| 5 | " | 5 | 15 | 25 | 35 | 30 | " | T | | | |
| 6 | " | 6 | 16 | 26 | 36 | 31 | " | O | | | |
| 7 | " | 7 | 17 | 27 | 37 | 32 | " | G | | | |
| 8 | " | 8 | 18 | 28 | 38 | 33 | " | E | | | |
| 9 | " | 9 | 19 | 29 | 39 | 34 | " | T | | | |
| 10 | Playback Out, High | 10 | 20 | 30 | 40 | 35 | " | H | | | |
| 11 | Record Input, High | 1 | 11 | 21 | 31 | 36 | " | E | | | |
| 12 | " | 2 | 12 | 22 | 32 | 37 | " | R | | | |
| 13 | " | 3 | 13 | 23 | 33 | 38 | " | | | | |
| 14 | " | 4 | 14 | 24 | 34 | 39 | " | P | | | |
| 15 | " | 5 | 15 | 25 | 35 | 40 | " | I | | | |
| 16 | " | 6 | 16 | 26 | 36 | 41 | " | N | | | |
| 17 | " | 7 | 17 | 27 | 37 | 42 | " | 26 | | | |
| 18 | " | 8 | 18 | 28 | 38 | 43 | " | to | | | |
| 19 | " | 9 | 19 | 29 | 39 | 44 | REC & PB GNDS | 44 | | | |
| 20 | Record Input, High | 10 | 20 | 30 | 40 | 45 | Dolby Control, Common | | | | |
| 21 | Dolby Control, 24V | 1 | 11 | 21 | 31 | 46 | Dolby Control, 24V | 6 | 16 | 26 | 36 |
| 22 | " | 2 | 12 | 22 | 32 | 47 | " | 7 | 17 | 27 | 37 |
| 23 | " | 3 | 13 | 23 | 33 | 48 | " | 8 | 18 | 28 | 38 |
| 24 | " | 4 | 14 | 24 | 34 | 49 | " | 9 | 19 | 29 | 39 |
| 25 | " | 5 | 15 | 25 | 35 | 50 | Dolby Control, 24V | 10 | 20 | 30 | 40 |

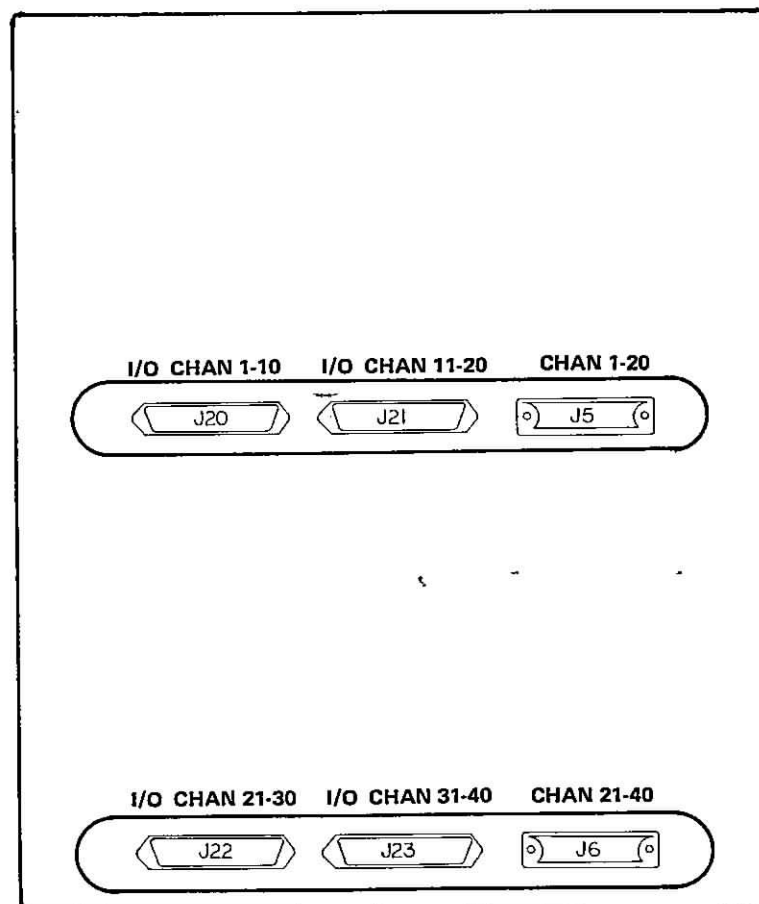
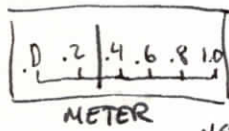
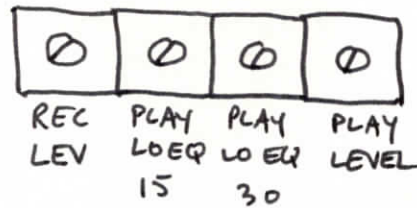


Figure 3-6. 40-Track Sync Panel, Rear Connectors

INSIDE METER PANEL



POWER

① 15

30 ips

SYNC

② 30

③ SCAN

SCAN

PRE

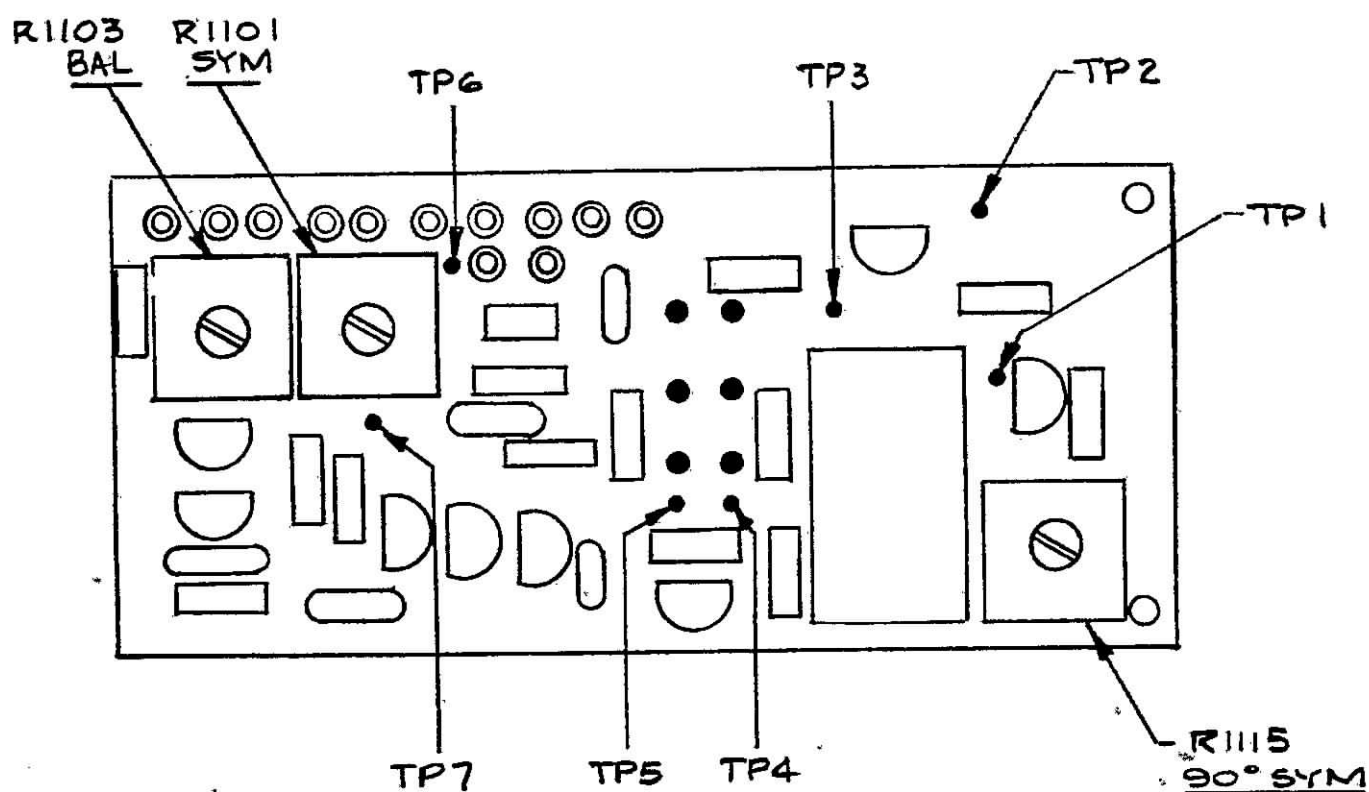
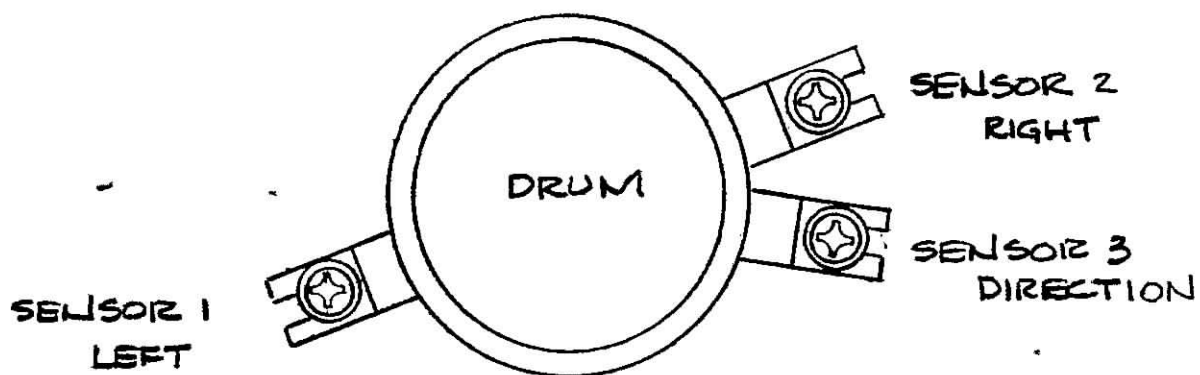
TO SET SPEED (IF TAPE SPEED WAVERS), PUT MACHINE AT DESIRED SPEED, VSO SWITCH IN NORMAL, MACHINE IN PLAY, AND ADJUST APPROPRIATE SCREW SO THAT METER STOPS WAVERING. THIS RANGE WILL BE ABOUT .2 to .8. IF MACHINE IS RELATIVELY COLD, SET BETWEEN .3 and .4. IF WARM, .5 OR SO.

NOTE THAT METER WILL WAVER UNTIL SCREW FINDS THE PROPER RANGE. AS LONG AS THE NEEDLE IS NOT STEADY, YOU HAVEN'T MOVED THE SCREW FAR ENOUGH.

SET PLAY LEVEL with 1000 cycle TONE

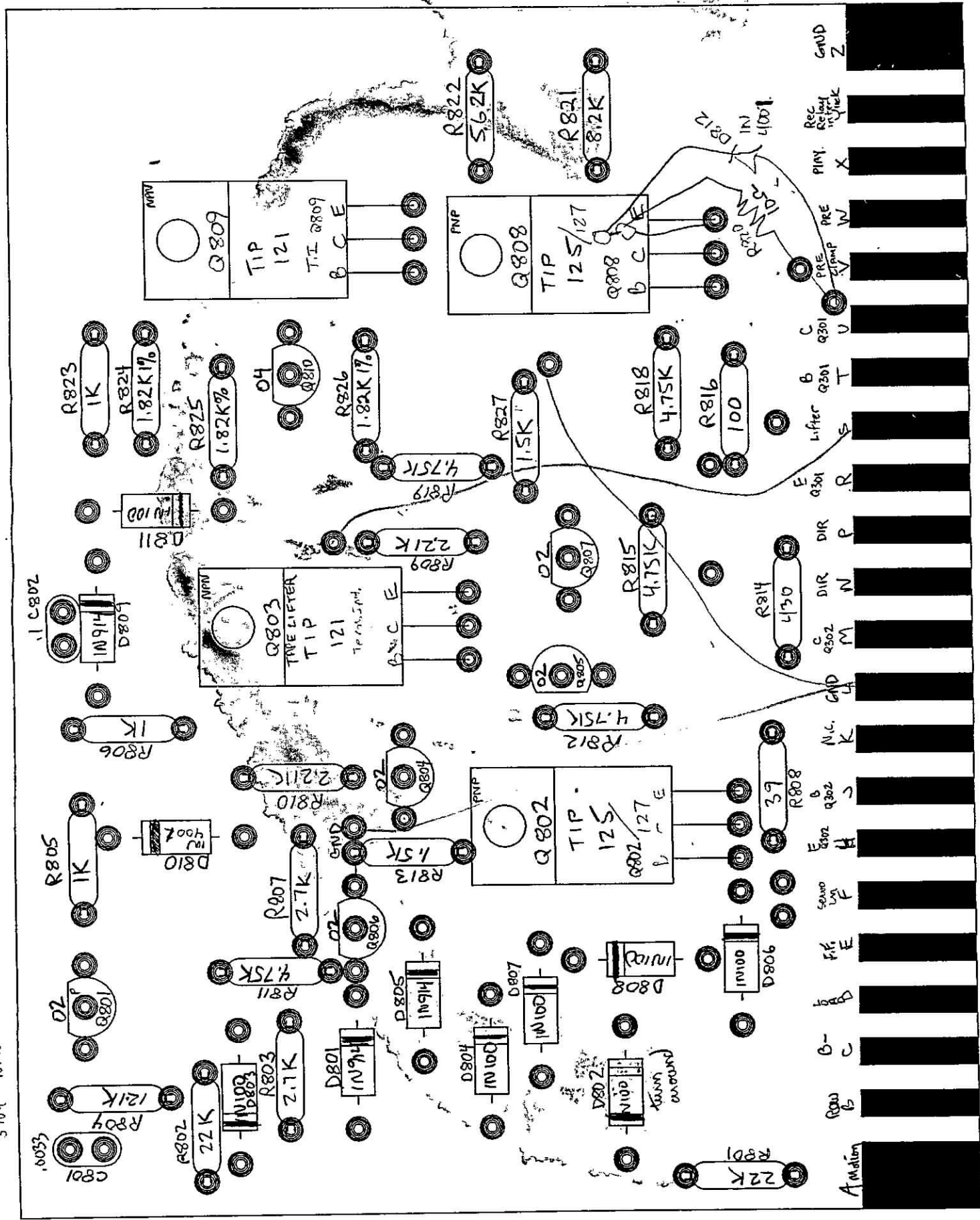
SET REC LEVEL with 1000 cycle TONE PUT machine in
RECORD (no input on) oscillator on patch bay

Patch oscillator to TAPE IN



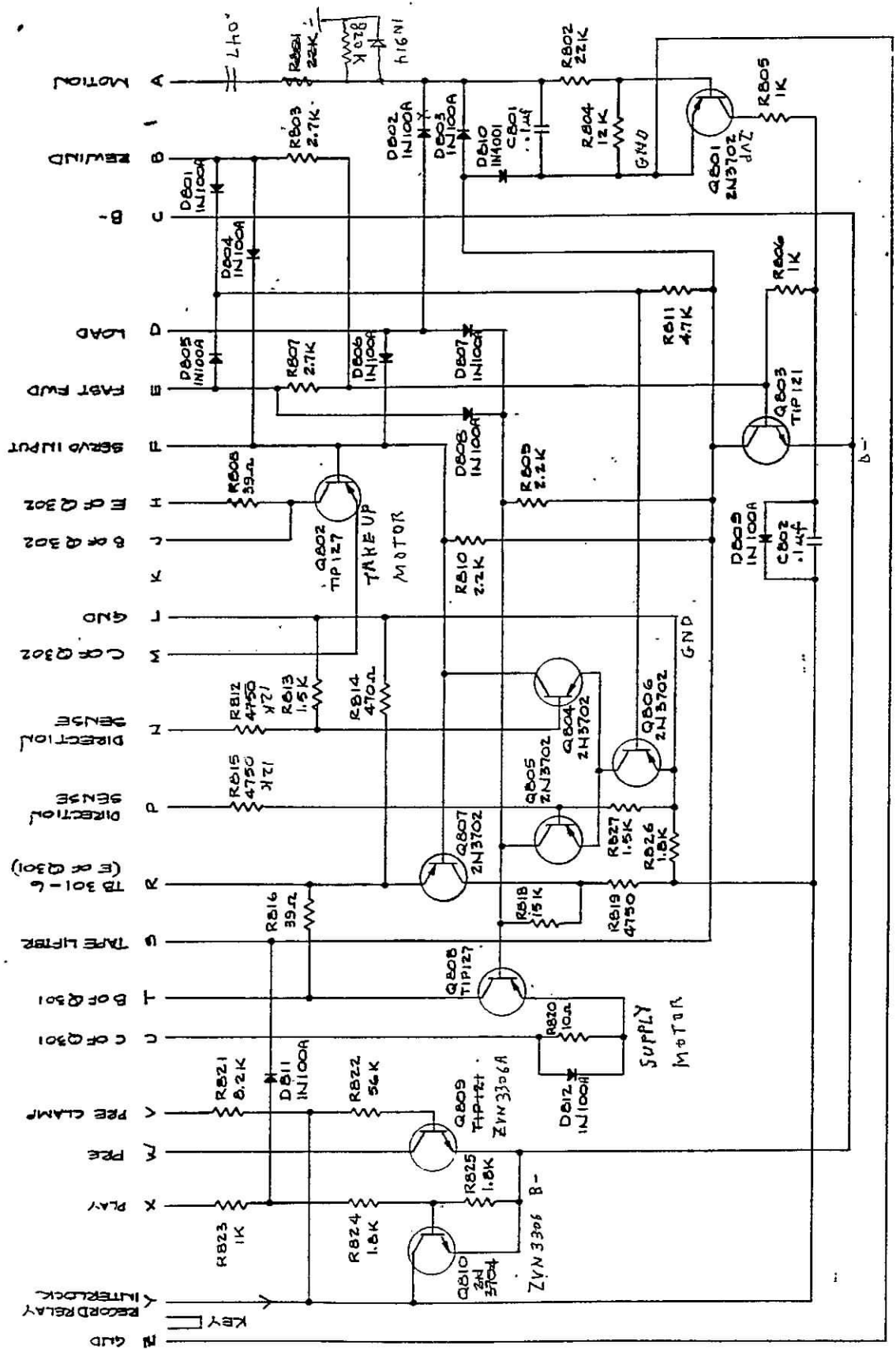
5704 - NPN

5704 - NPN

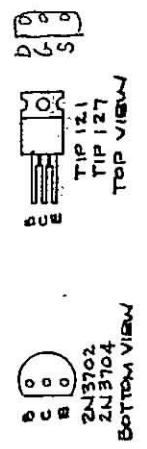


REVISIONS

| DATE | BY |
|---------|---------|
| 1-23-51 | B-C-002 |
| 1-23-51 | B-C-002 |

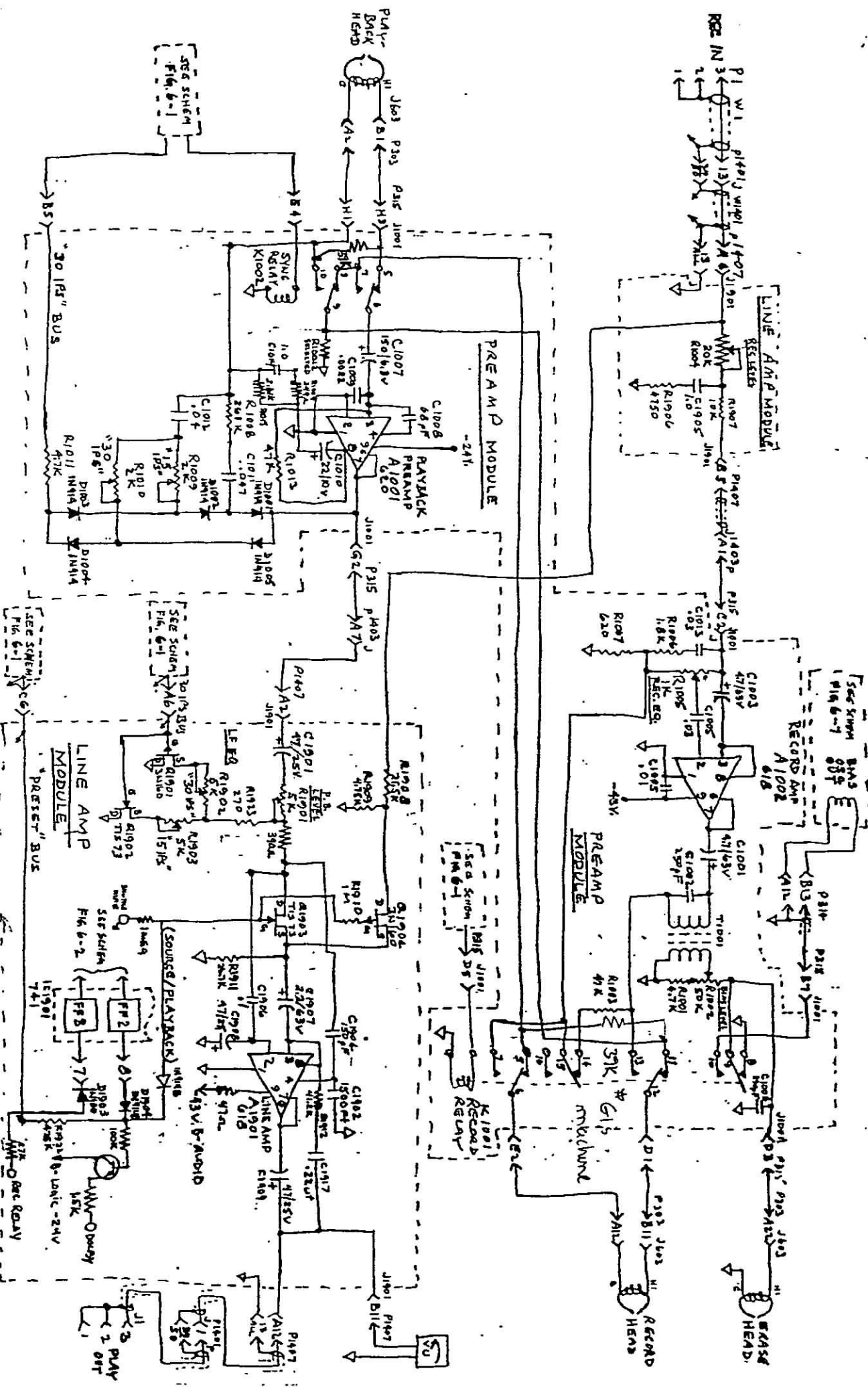


ALL CAPACITORS: 50VOLT AND IN MICROFARADS
ALL RESISTORS: 1/4 WATT



| | |
|----------------------------|--------------------------|
| STEPHENS ELECTRONICS, INC. | |
| DATE: 3 JUL 59 | APPROVED BY: [Signature] |
| SERVO CARD - 310163 A | |
| MODELS: 108A-104A | FIGURE: 6-12 |
| SERVO CARD - 310163 A | |
| SC-0801A | |

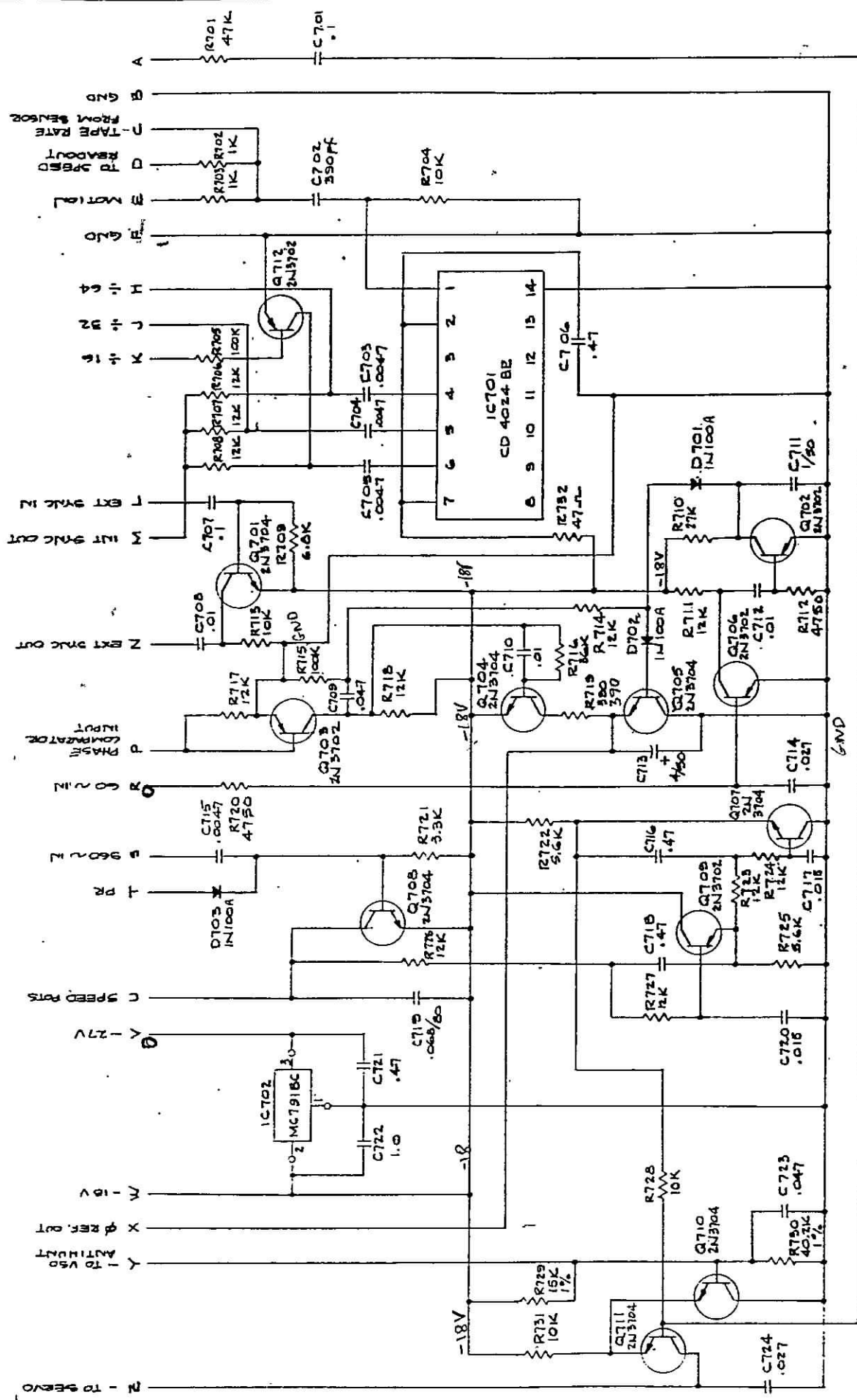
| LAST 3YM | NO. USED | OMITTED |
|----------|----------|---------|
| C802 | | |
| Q810 | | |
| R827 | | |



SC-0003

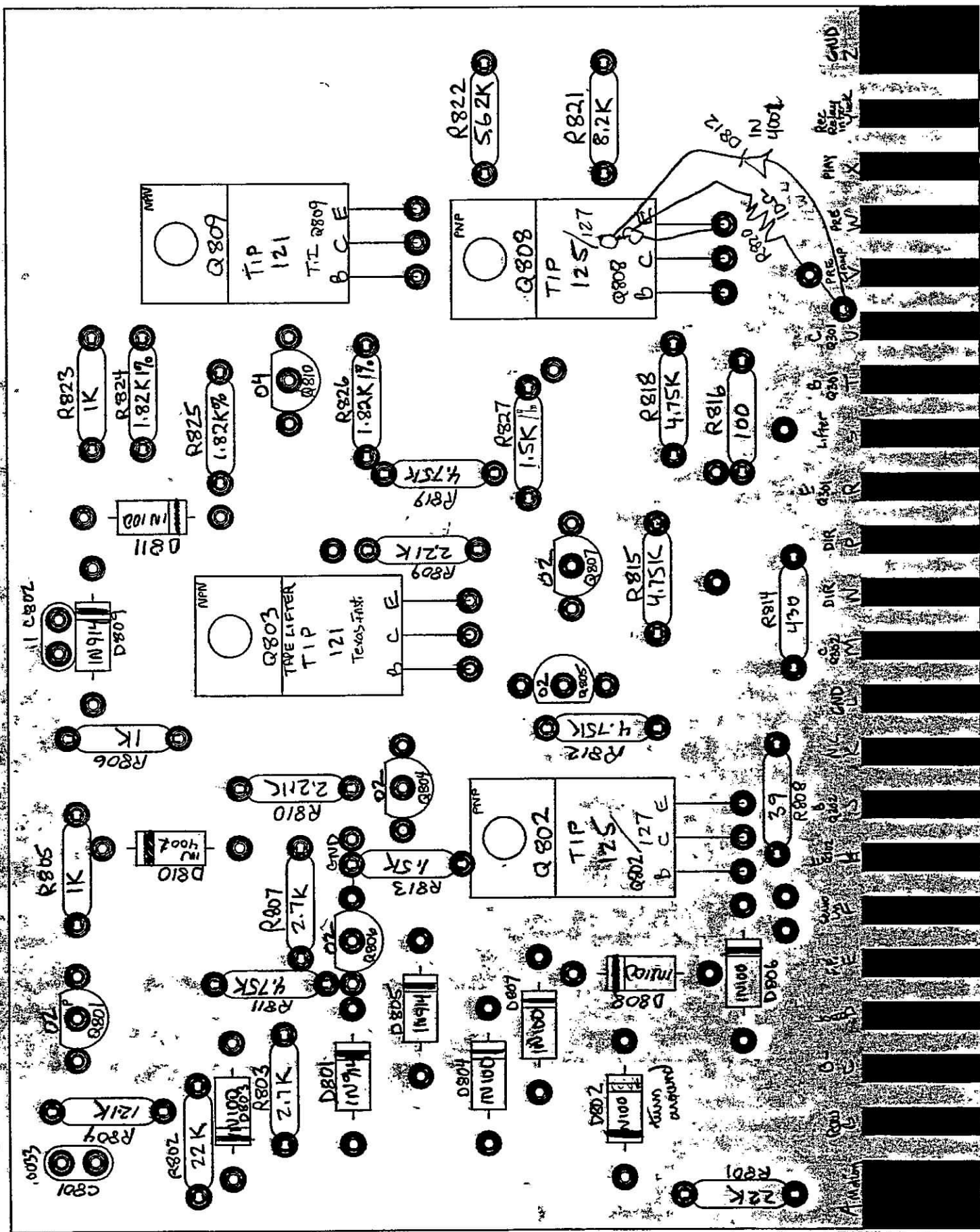
7/30/79 NB RN 6/1/82

SCHEMATIC, RECORD AND PLAYBACK SYSTEM
FIGURE 6-3

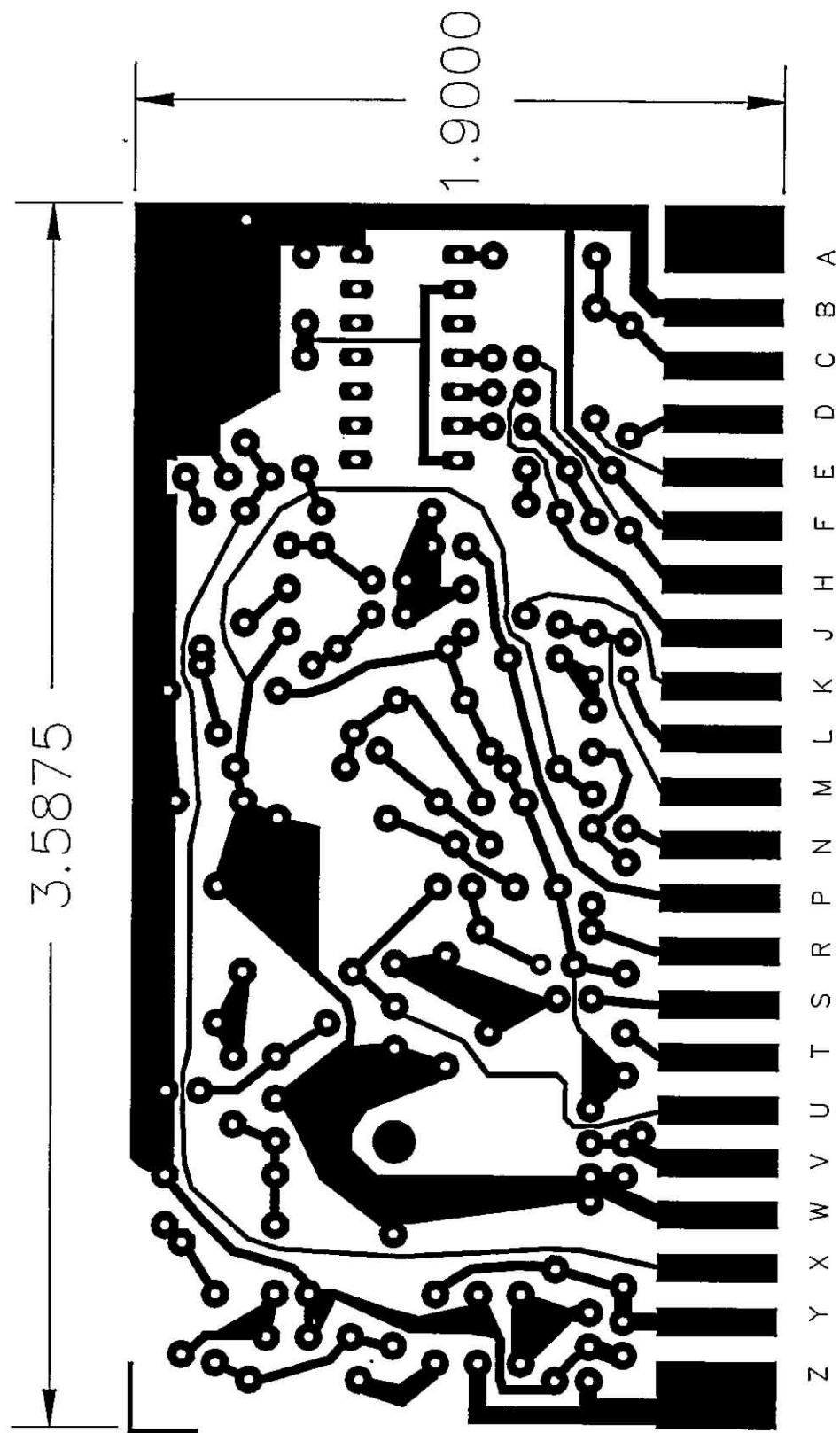


ALL CAPACITORS 50VOLT AND IN MICROFARADS
ALL RESISTORS 1/4 WATT

| | |
|-------------------------------------|--------------------------|
| STEPHENS ELECTRONICS, INC. | |
| SCALE: 1" = 10" | APPROVED BY: [Signature] |
| DRAWN BY: [Signature] | DATE: 11/14/78 |
| REVISION: 8-28-80 | |
| SCHEMATIC CONVERTER CARD - 310164 A | |
| MODELS: [Signature] | DATE: 11/14/78 |
| DRAWING NUMBER: 310164 A | |



SOLDER SIDE





SERVO PCB
SOLDER SIDE

35

JD-8 B25
LIGHT GND.

JD-7 B24
YELLOW LIGHT BUSS

B16,D16,F16,H16
SEL-SYNC RELAYS

JD-2 / JD-2 / D24
SEL-SYNC BUSS

JD-5 F24
RECORD BUSS

B20,D20,F20,H20
RECORD RELAYS

INPUT-OUTPUT
220-IN/OUT-REM
(AMPHENOL)

B6,D6,F6,H6
OUT

A1,C1,E1,G1
IN

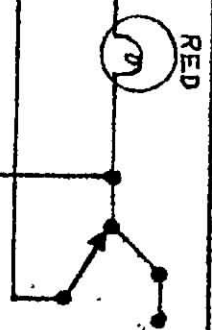
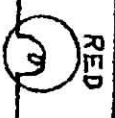
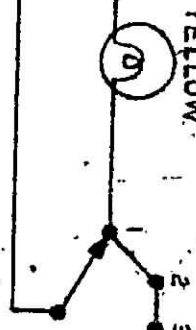
A5,C5,E5,G5,B10,D10
F10,H10,A15,C15,E15,G15
GND.

-39V. H24

PRELIM. PRECEG 2.5
8 D F H - GND

104

YELLOW



1-∞
2 PB
3 INPUT
4. PB
} RECORD

4300

4 CHAN.
LINE AMP.
CHASSIS

H7,E8
D7,B5

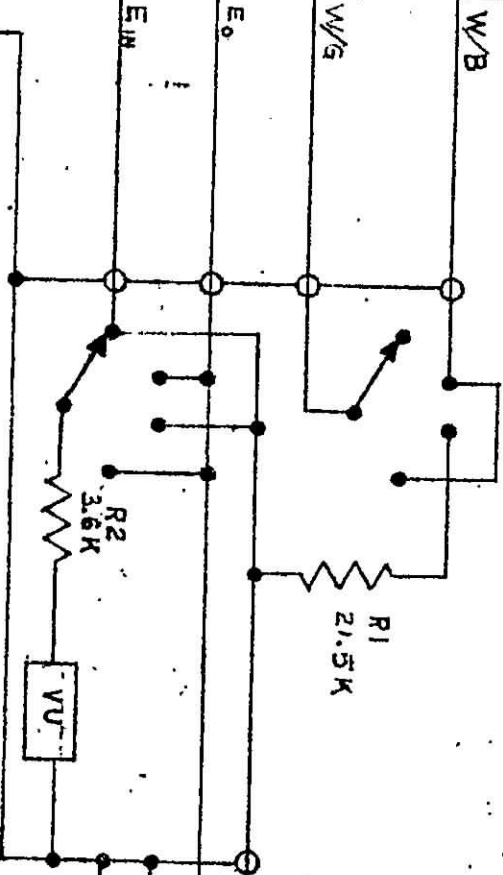
G10,E10
C10,A10

H13,F13
D13,B13

H1,E2
D1,B1

INSO2-REM
F13,5,7,9,11,E12

502



AMPHENOL
CONNECTOR
TYPE
57-40500

INPUT 35-38

OUTPUT 43-46

INPUT GND.
10-13

OUTPUT GND.
18-21

STEPHENS ELECTRONICS

SCALE:

APPROVED BY:

DATE: 5-30-75

Diarr

DRAWN BY DMS

REVISED 8-26-80

SEL-SYNC PANEL 811D

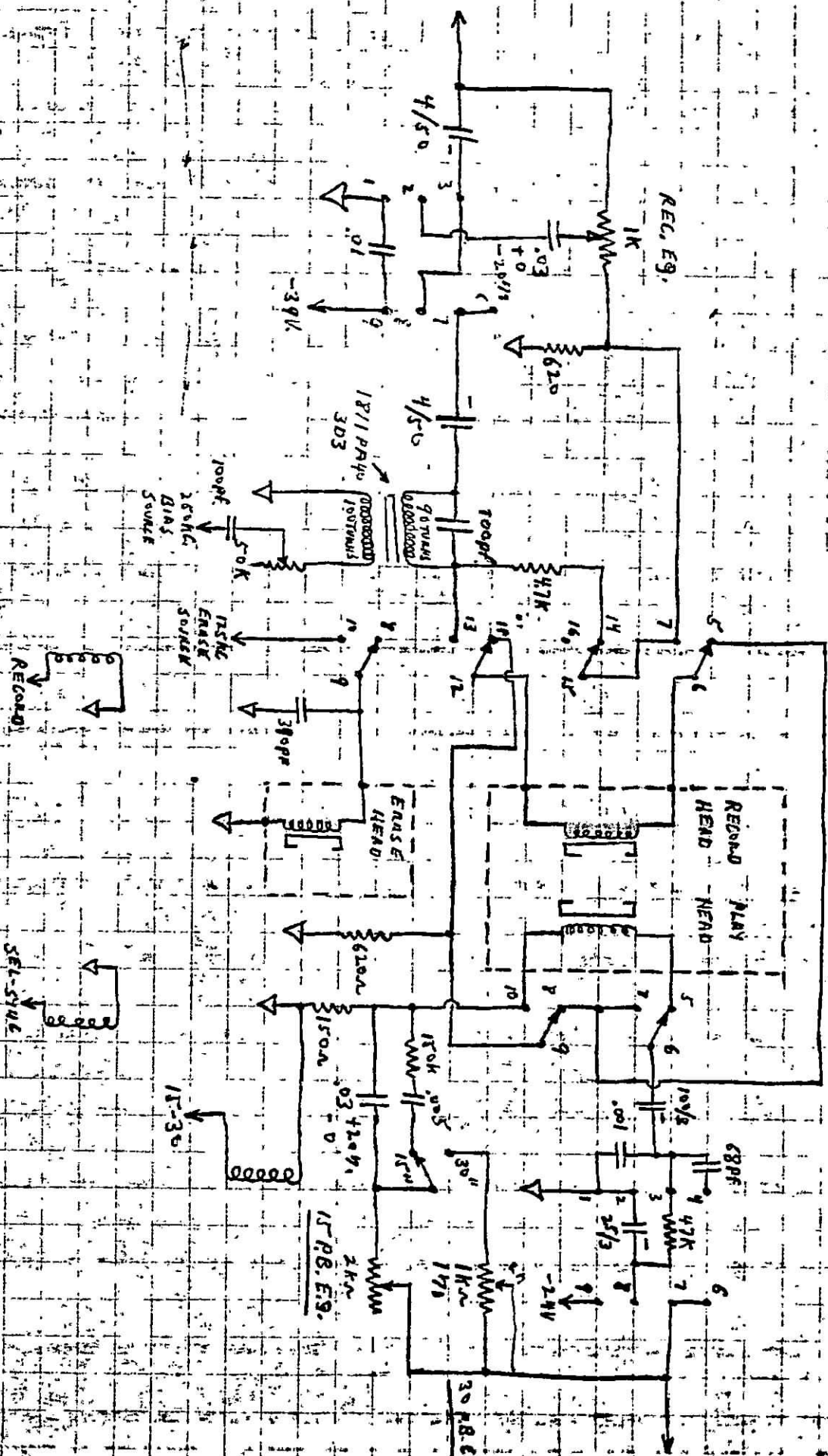
TRACKS 1-4

DRAWING NUMBER

110508

8110-3200 STN ES

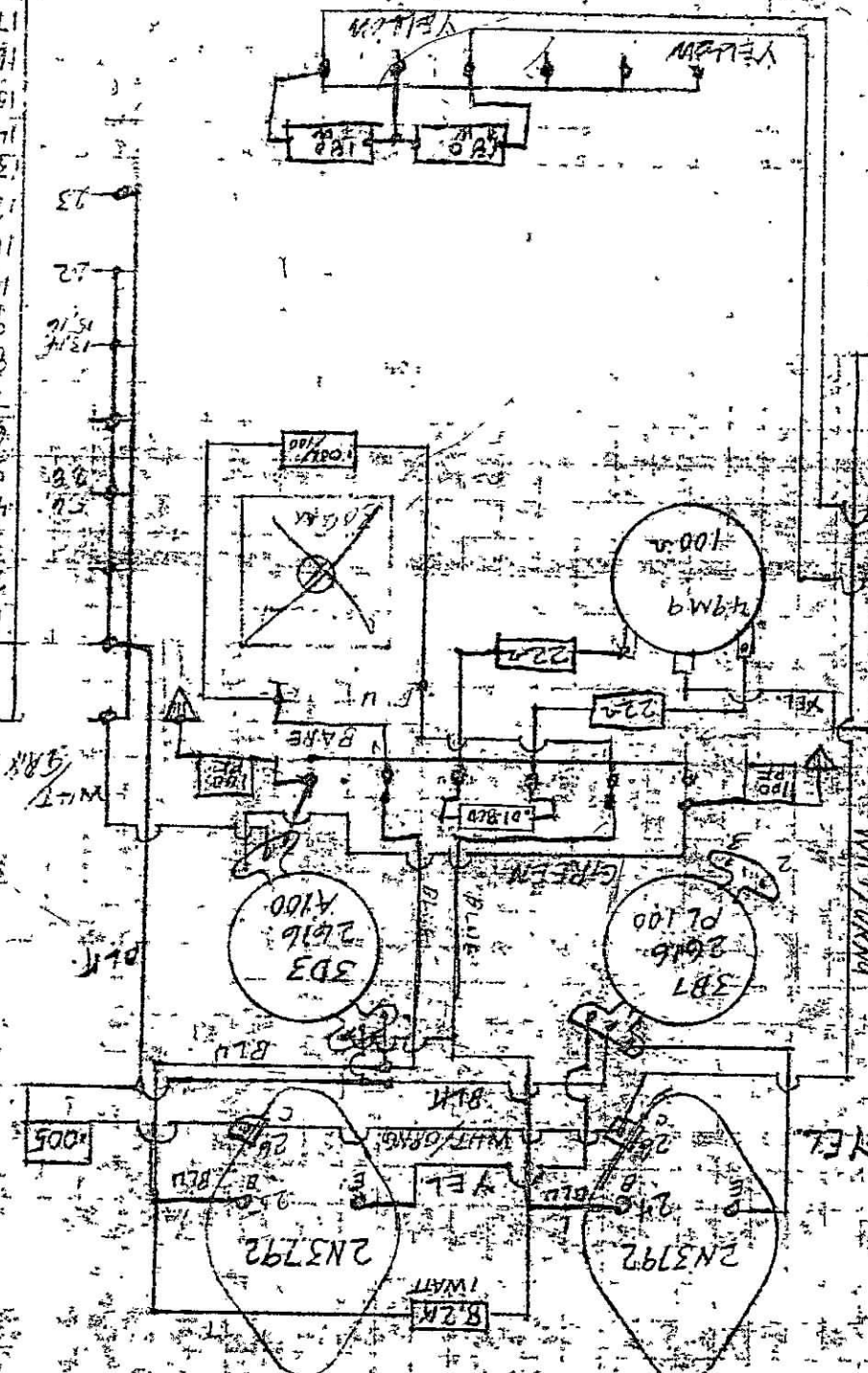
3-1-72



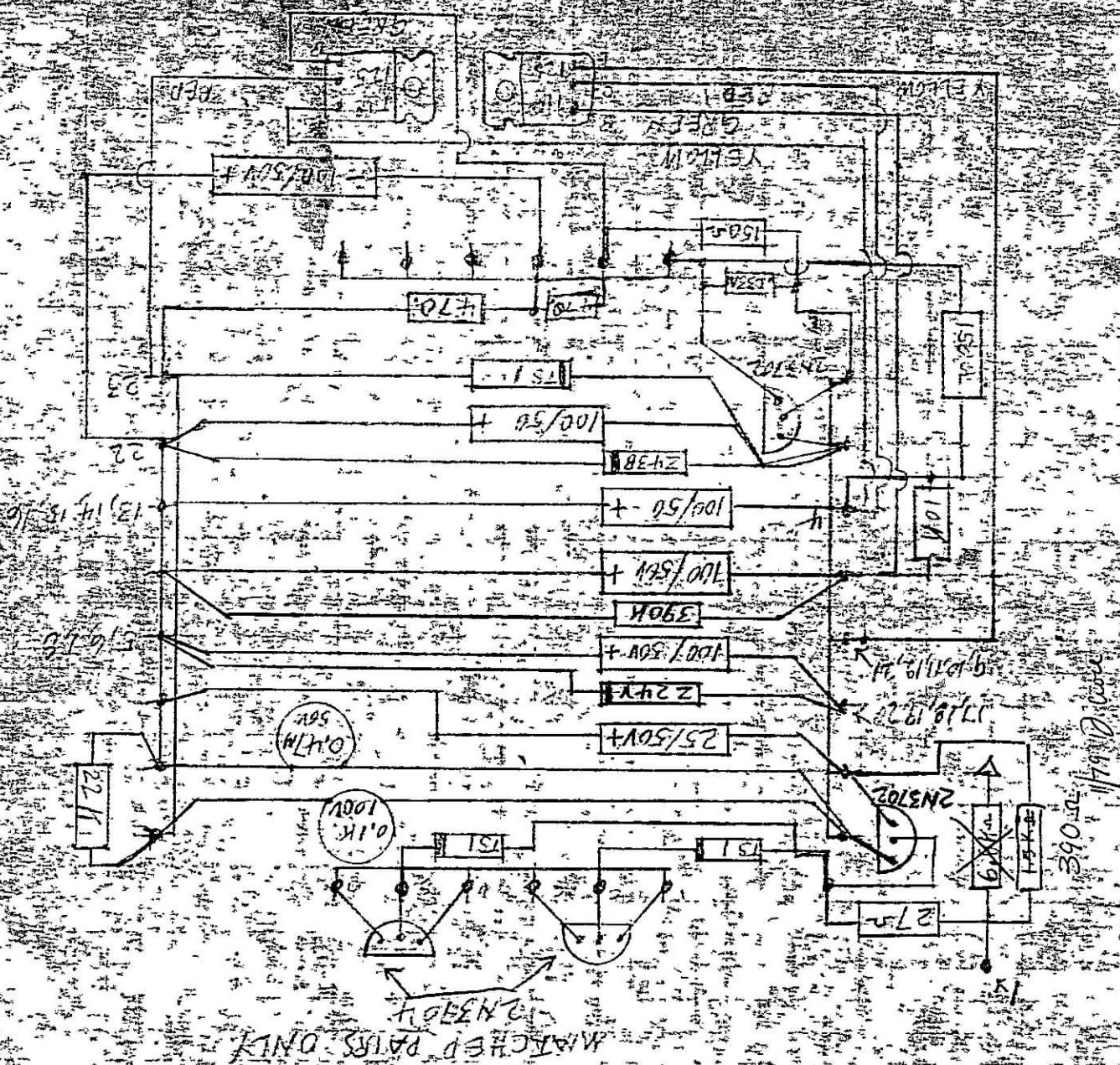
PRODUCER'S LITERATURE

- BIAS CONNECTOR
WIRE CODE
1. VIOLET - H 11.
 2. WHITE BOFH-13
 3. WH/BK ACES-12
 4. BLUE B-11K
 5. BLACK A-10
 6. BLACK C-10
 7. BLACK E-10
 8. BLACK G-10
 9. CRANG-B-9
 10. CRANG-D-9
 11. CRANG-F-9
 12. CRANG-H-9
 13. BLACK A-8
 14. BLACK C-8
 15. BLACK E-8
 16. BLACK G-8
 17. YELLOW-B-7
 18. YELLOW-D-7
 19. YELLOW-F-7
 20. YELLOW-H-7
 21. WH/BLK ACES-12
 22. RED-B-1
 23. BROWN-D-1
 24. WHITE-F-1
 25. WHITE-C-1

USED IN SLAVE



8110 BIAS STOPPLY



A10, B0, E10, G12
TO 66T SYNC SWITCH FOR OUT PHASE SELECT

B5, D7, E8, H7

PLAY INPUT

A6, C6, E6, H6

5K

CM

100/25V

+

10K CM

50/31

100/25

100/50

27.2

4.8

A2, C2, D3, G2

REC INPUT

B1, D1, H1, E2

50 IPS CONTROL IN

412

25K

REC LEVEL

8.2K

4.7K

10K CM

IN4001

IN4001

DISTORTION TRIM

6K

PLAY L.F. EQ

50 IPS

005

CM

CM

CM

CM

NOTES
1. BOTH RELAYS ARE ENGAGED
2. RELAYS ARE COMMON TO ALL CHANNELS
3. PIN NUMBERS ARE FOR GREEN AMPHENOL CONNECTORS
4. ALL RESISTOR VALUES ARE 1/4 WATT

STEPHENS ELECTRONICS INC.

SCALE

DATE 5-30-75

APPROVED BY

618

DRAWN BY

618

REVISED

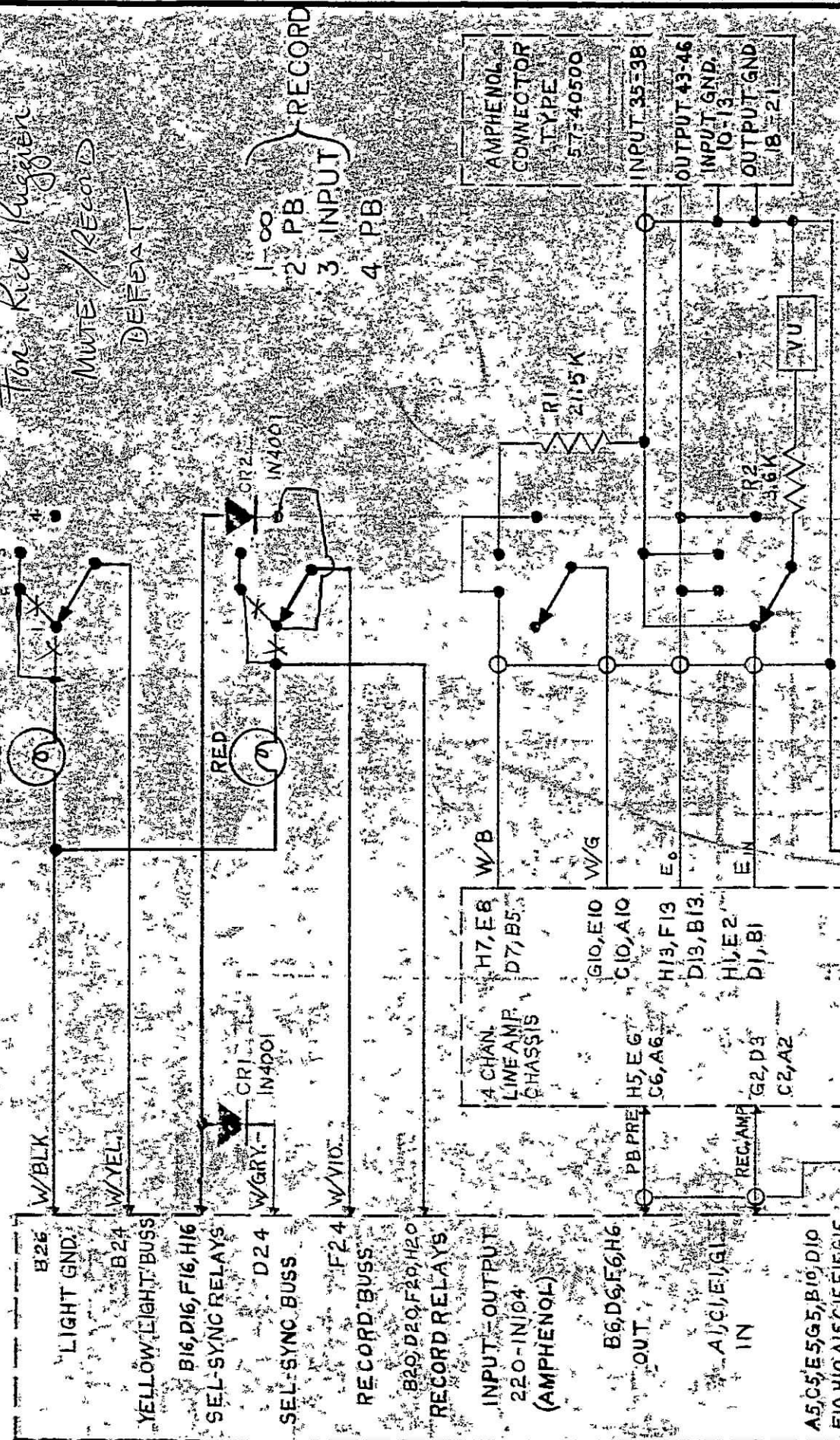
4300 LINE MULTIPLIER CARD

FOR 811-B 66T MAGNICS

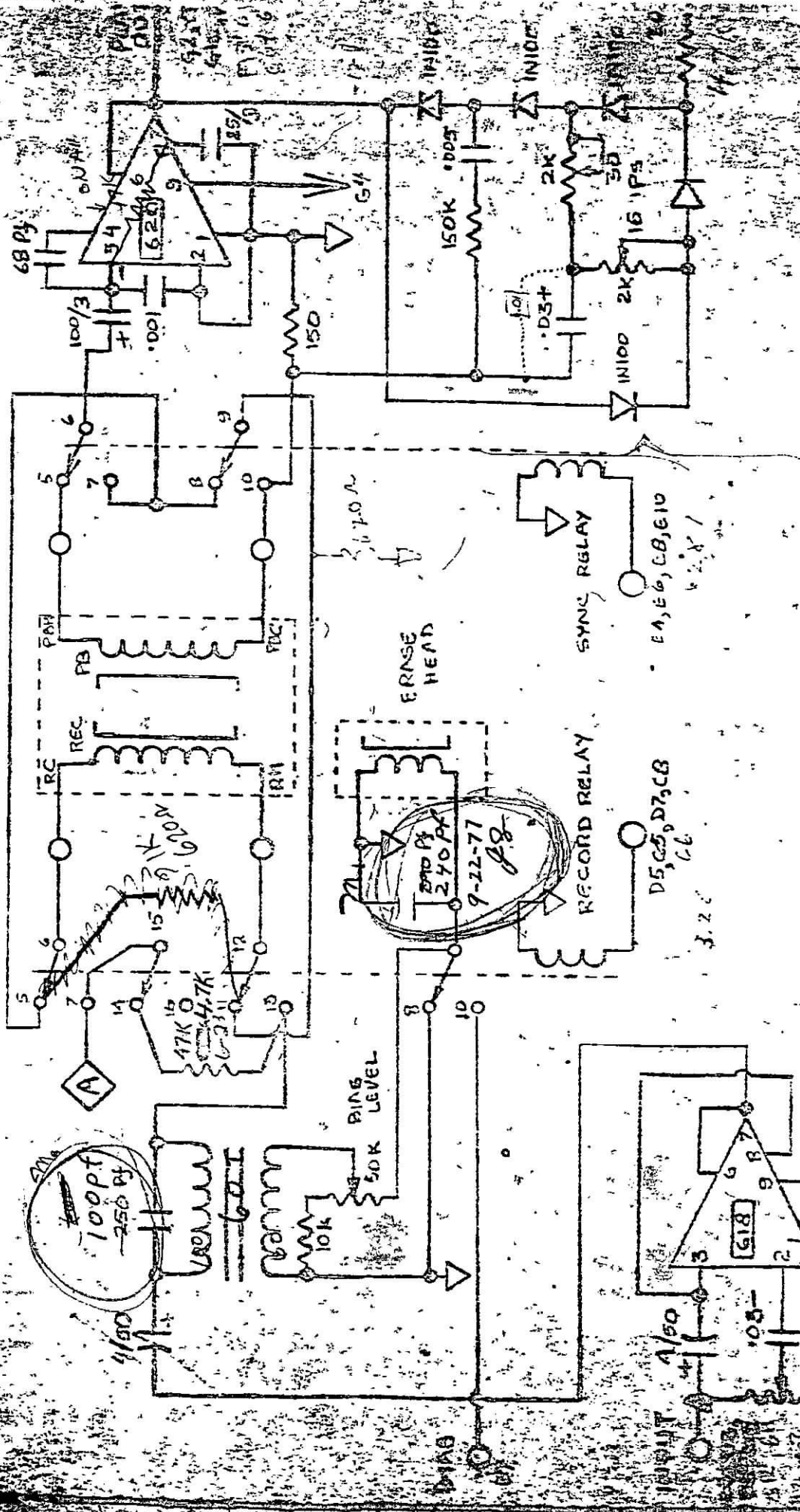
DRAWING NUMBER

110932-1

For Rice/Ruggier
MUTE/RECORD
DEFINAT



| | | | |
|----------------------|--|----------------|-----------------|
| STEPHENS ELECTRONICS | | APPROVED BY: | DRAWN BY DMS |
| | | DATE 5-30-75 | REVISED 8-26-80 |
| SEL-SYNC PANEL 811D | | DRAWING NUMBER | |
| TRACKS 1-4 | | 10308 | |



| CHAN | 1 | 2 | 3 | 4 |
|------|----|----|-----|-----|
| RC | E2 | A4 | A10 | D11 |
| PH | D1 | A2 | A12 | D15 |
| PRC | H1 | H5 | H9 | B12 |
| PH | H3 | H7 | H11 | H13 |
| E | D3 | A6 | A8 | D9 |

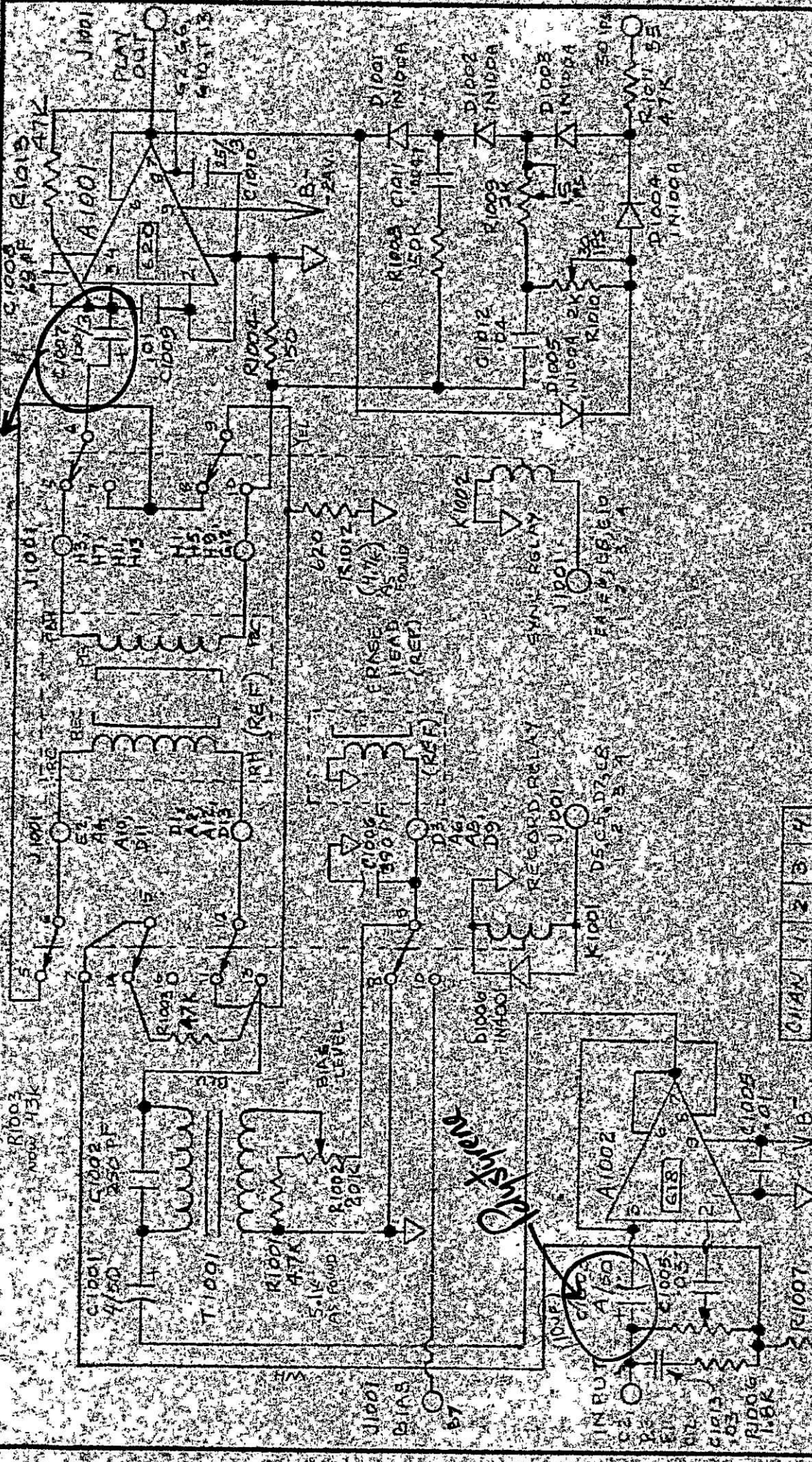
AMPHENOL COMMA
PIN NUMBERS
CARRYING SIGNAL

SERIAL #

STEPHENS ELECTRONICS INC
PRODUCERS WORKSHOP MODIFICATION

COALITION:
APPROVED BY:
DATE: 6/6/75
HIGH BIAS FREQ: 250 KHz.
DRAWN BY:
DATE:
PRE AMPL ELECTRONICS 9/20
DRAWING NUMBER:
911-A 7100

INCREASE TO 2000 OHM OF CAPACITANCE



STEPHENS ELECTRONICS INC

PR6 AMP ELECTRONICS

811 D 3100

10910-C

DRAWN BY: BCC/1

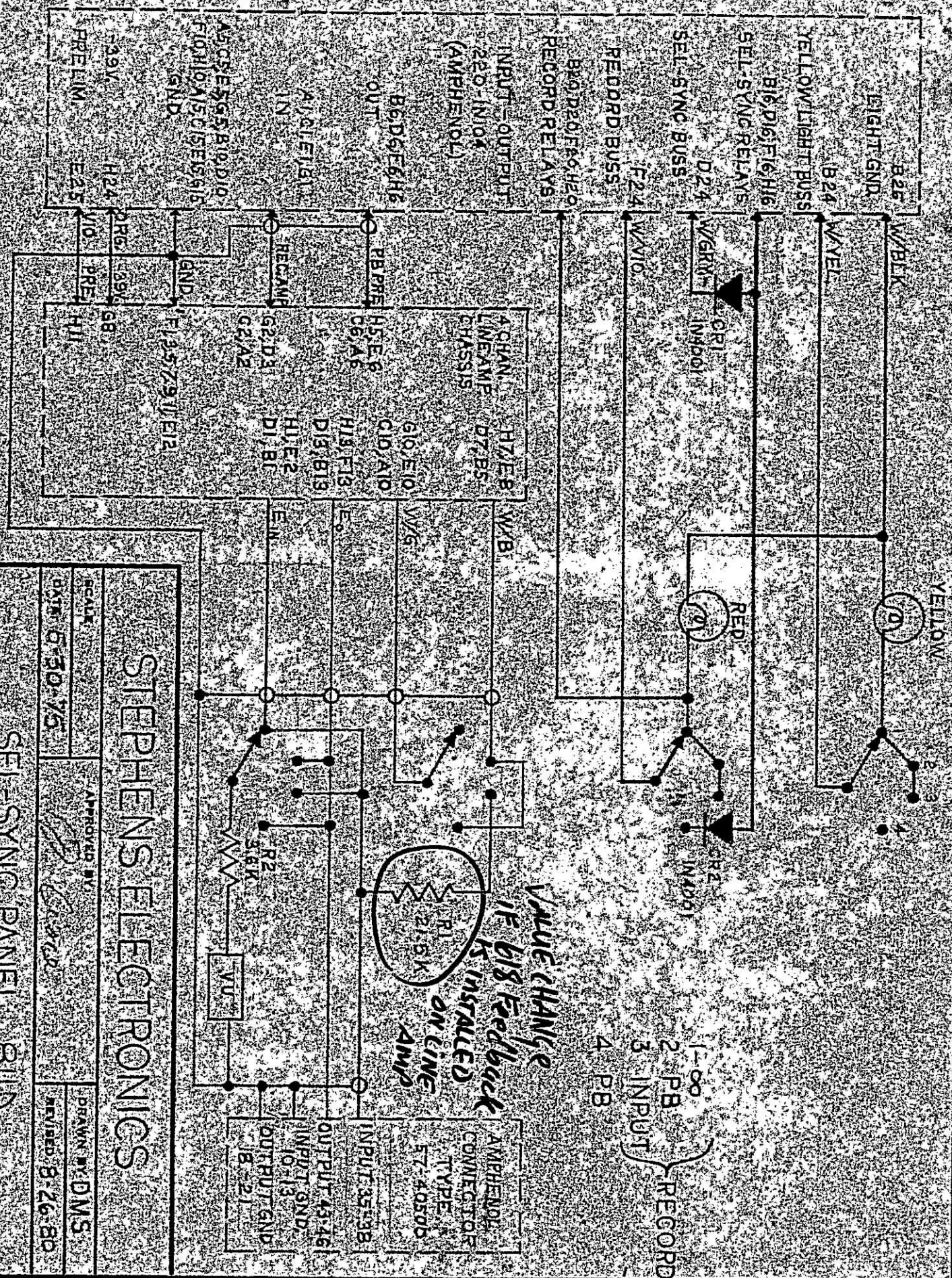
REVIEW: 7/10/75

APPROVED BY:

DATE: 6/6/75

| | | | | |
|------|----|----|----|----|
| CHAS | 1 | 2 | 3 | 4 |
| PC | 5 | 6 | 7 | 8 |
| PH | 9 | 10 | 11 | 12 |
| PD | 13 | 14 | 15 | 16 |
| PE | 17 | 18 | 19 | 20 |

IMPROVED COPY
 100V 100F 100K
 100V 100F 100K
 100V 100F 100K



STEPHENS ELECTRONICS

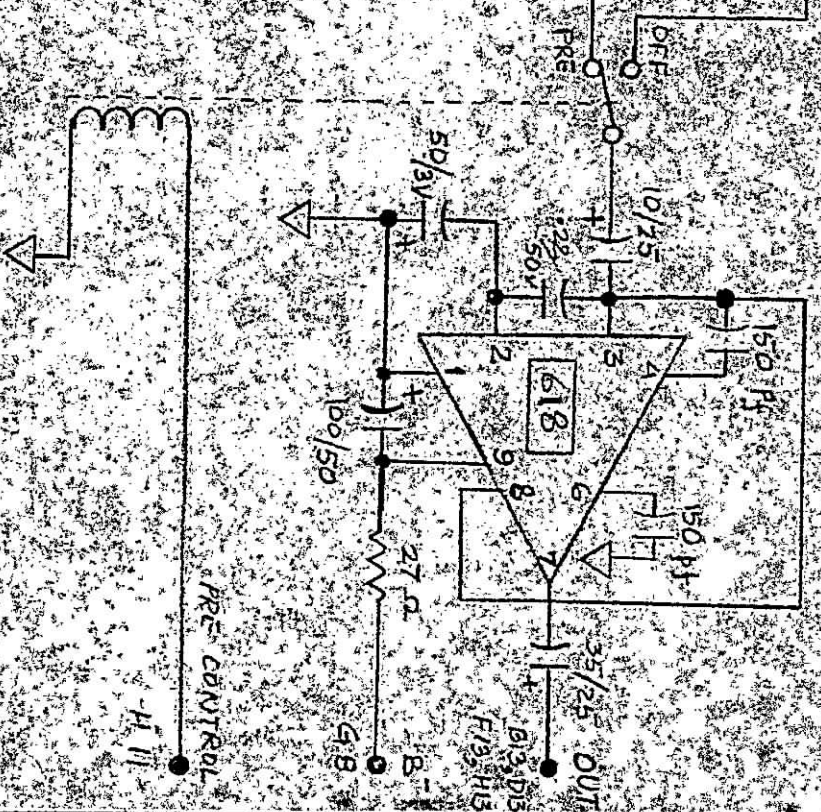
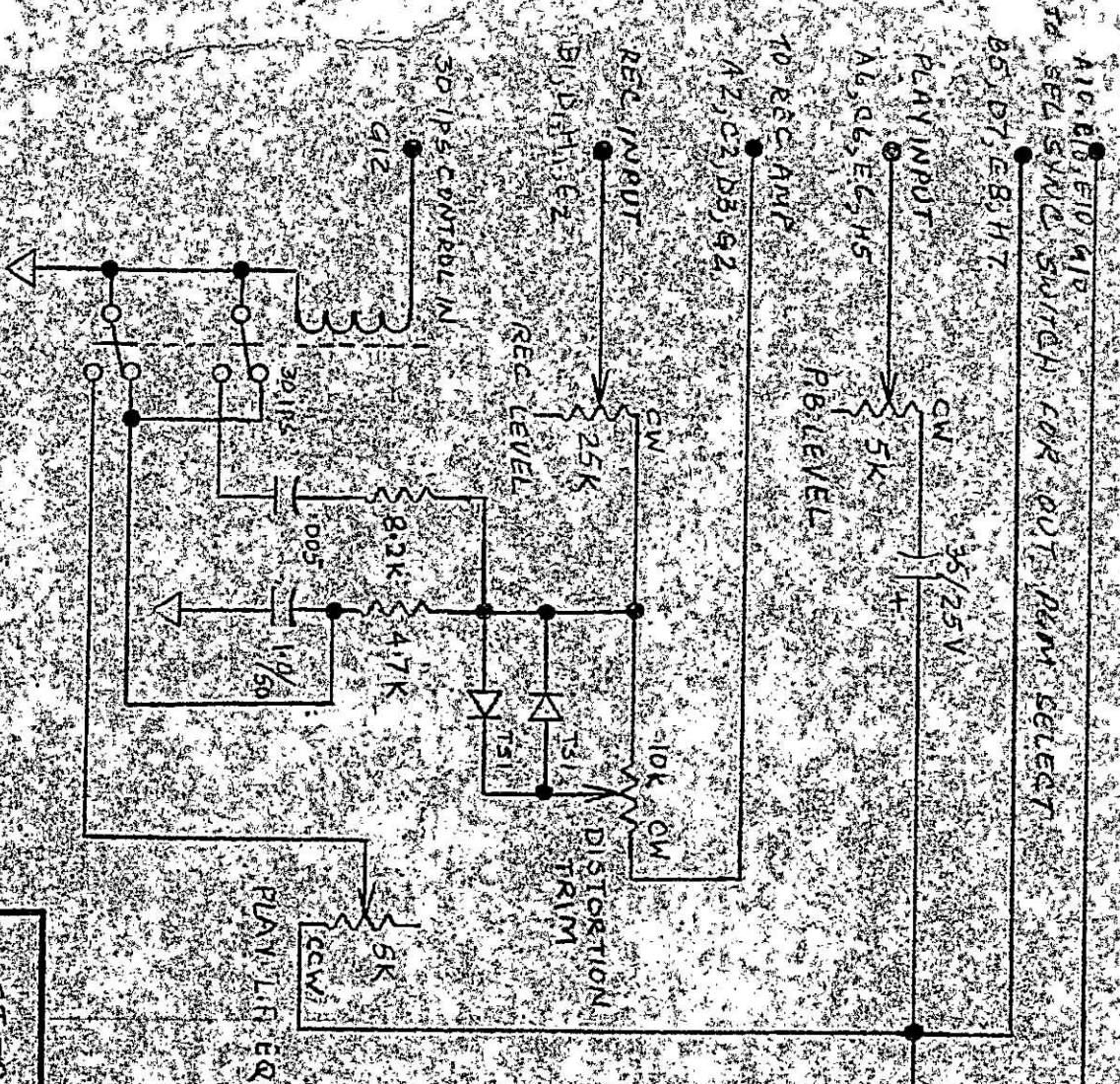
APPROVED BY

| | | |
|--------------|--------------------|-----------------|
| SCALE | APPROVED BY | DRAWN BY/DMS |
| DATE 6-30-75 | <i>[Signature]</i> | REVISED 8-26-80 |

SEL-SYNC PANEL BID

TRACKS 1-4

DRAWING NUMBER
1105008



NOTES

1. BOTH REGAYS ARE ENGRAINED
2. REGAYS ARE COMMON TO ALL CHANNELS
3. PIN NUMBERS ARE PER GREEN
4. ALL RESISTOR VALUES ARE X 1000

STEPHENS ELECTRONICS INC

SCALE

APPROVED BY:

DRAWN BY: 1-8-85

DATE: 5-30-75

REVISED

4300 LINE AMPLIFIER CARD

FAR 811-D BLEED THROUGH

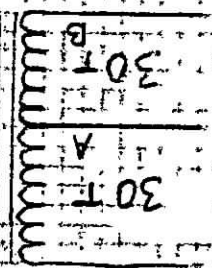
DRAWING NUMBER

110932-A

9/12/74 Randy

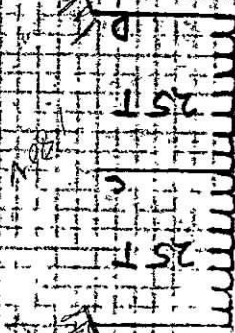
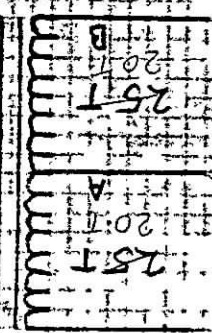
O.S.C. TRANS

30 TURNS OF #24 SOLID ENAMEL COATED WIRE BELDON #8052
 3 TURNS OF #26 SOLID ENAMEL COATED WIRE BELDON #8065
 WIND 2 WIRES AT A TIME, THE 30 THEN THE 3'S
 BORDIN #2616 PCB1 SEPERATED BY TAPE
 CORE #2616P A100-3D3

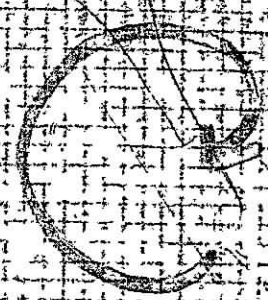
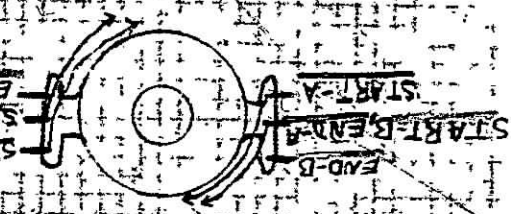


STANDARD OUTPUT - ERASE

25 TURNS OF #24 SOLID ENAMEL COATED WIRE BELDON #8052
 WIND 4 WIRES AT ONE TIME
 CUT THE 4 WIRES TO A LENGTH OF 56 INCHES BEFORE TURNING
 BORDIN #2616 PCB1
 CORE #2616 PL100 3B7

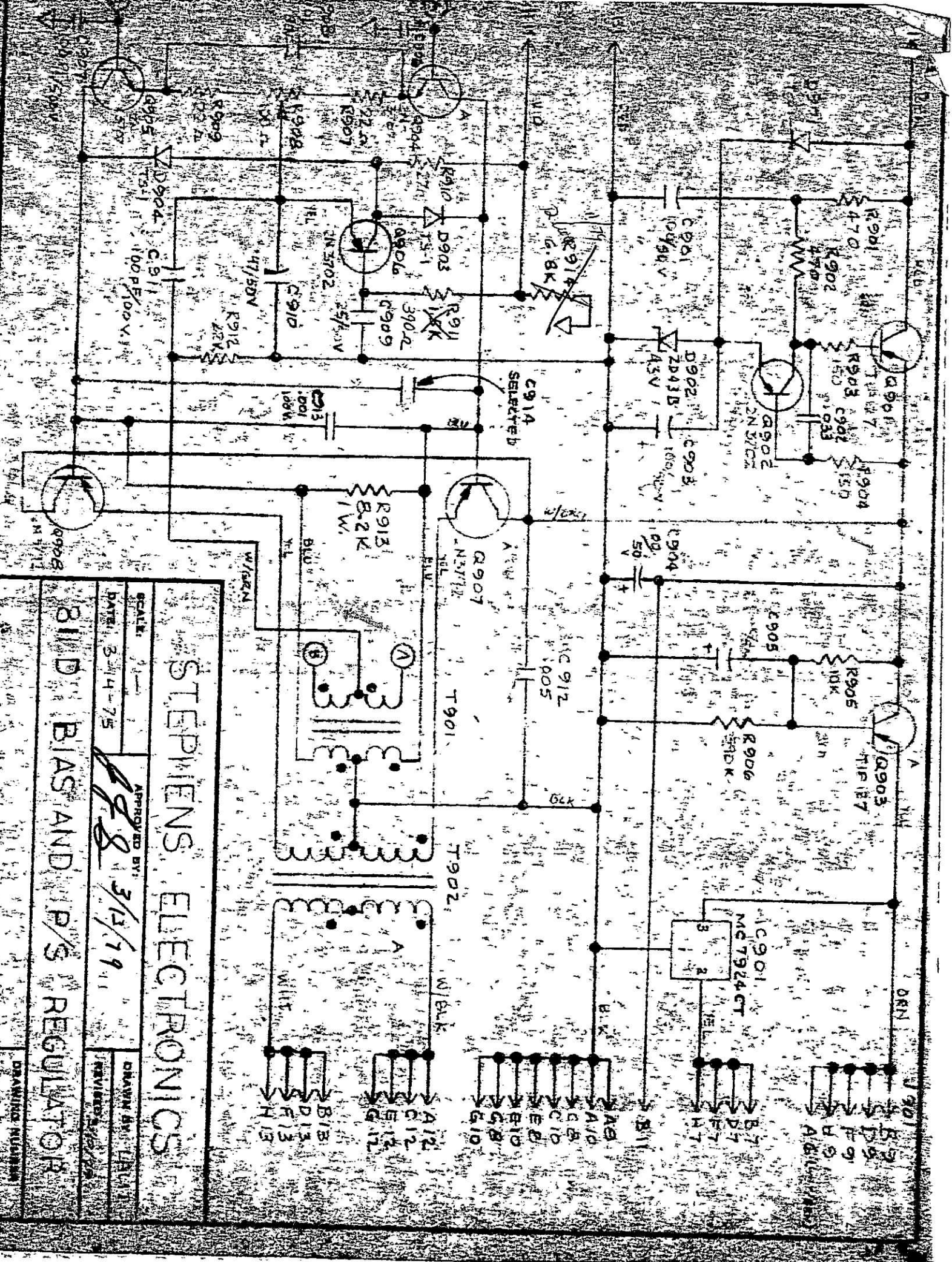


CORES AND BOBINS FROM FERROXUBE CORR
 WRAP COILS WITH TAPE WHEN FINISHED AND CHECK FOR GOOD FIT IN CORES



CLOCKWISE

223 625
 223 625
 233 625
 233 625



STEPIENS ELECTRONICS

SCALE: 1-
DATE: 3-14-75

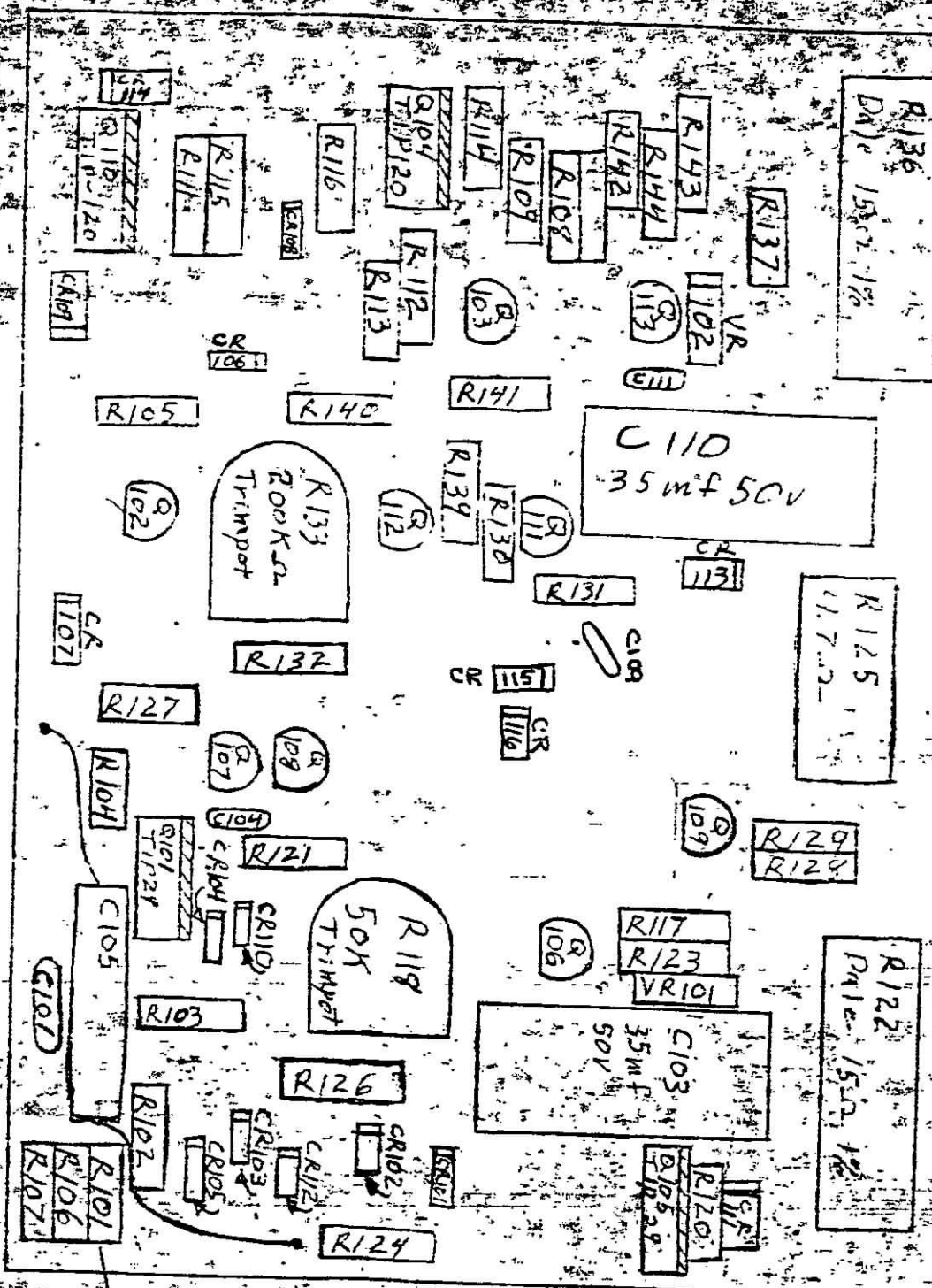
APPROVED BY: *[Signature]*
3/13/79

DRAWN BY: LAL11
REVISED: 02/79

811D BIAS AND P/S REGULATOR

DRAWING NUMBER: 100000-00

GA
 N
 PL
 PRE
 P
 GA
 ZPSE
 TRAE
 COL
 5AC
 FNT
 EMIT
 GNE
 B
 BASE
 COL
 SERVO
 FST
 LOA
 B
 REW
 NOTIC



STEPHENS ELECTRONICS, INC.

SCALE 2:1
 DATE 10/10/74
 APPROVED BY:
 DRAWN BY: PKW
 REVISED:

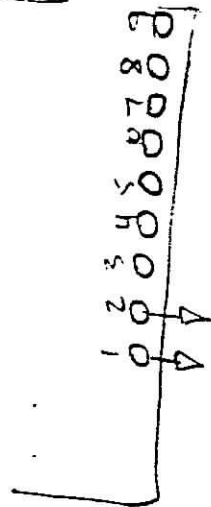
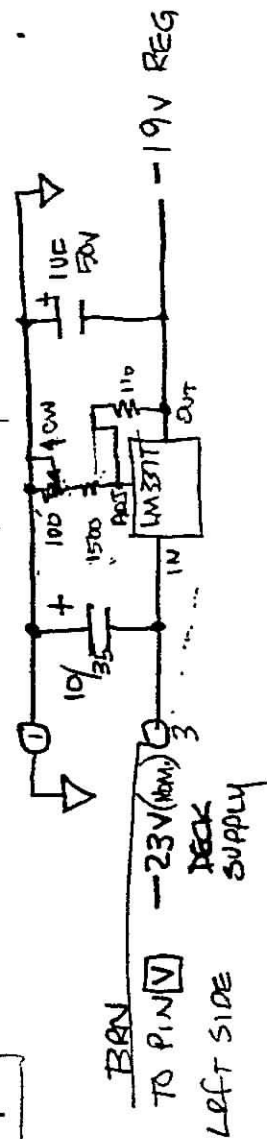
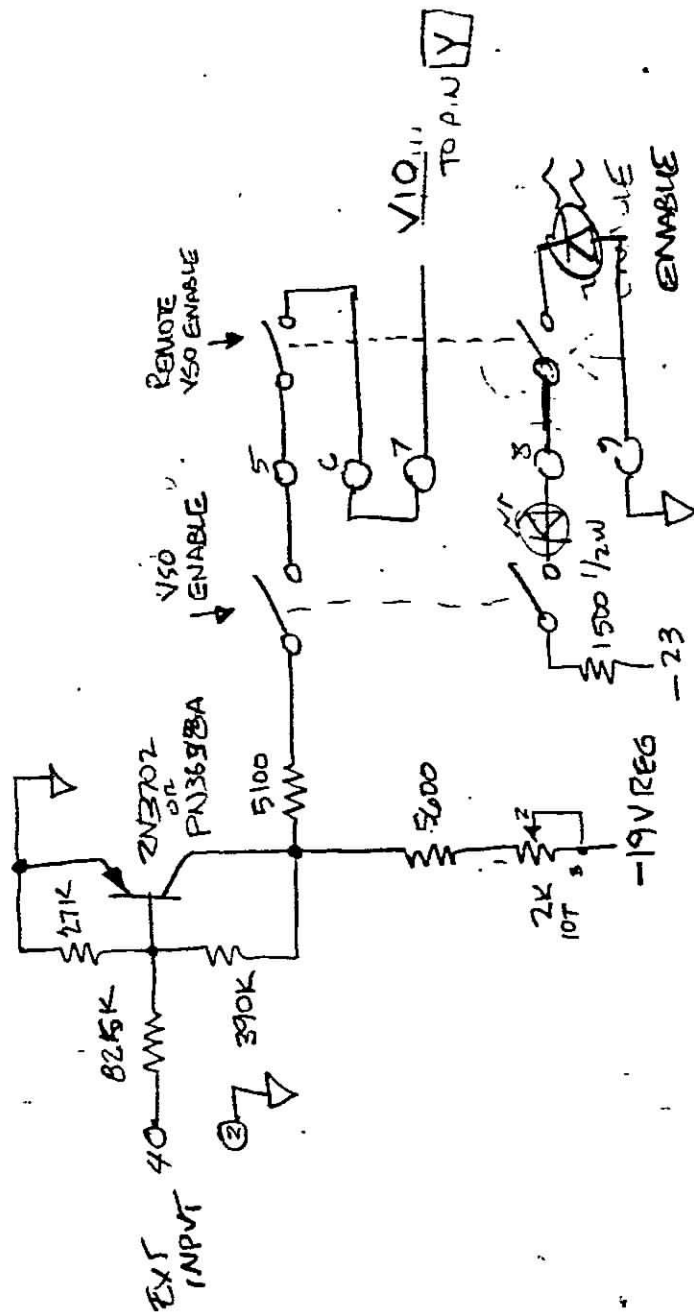
Servo Card # 310163

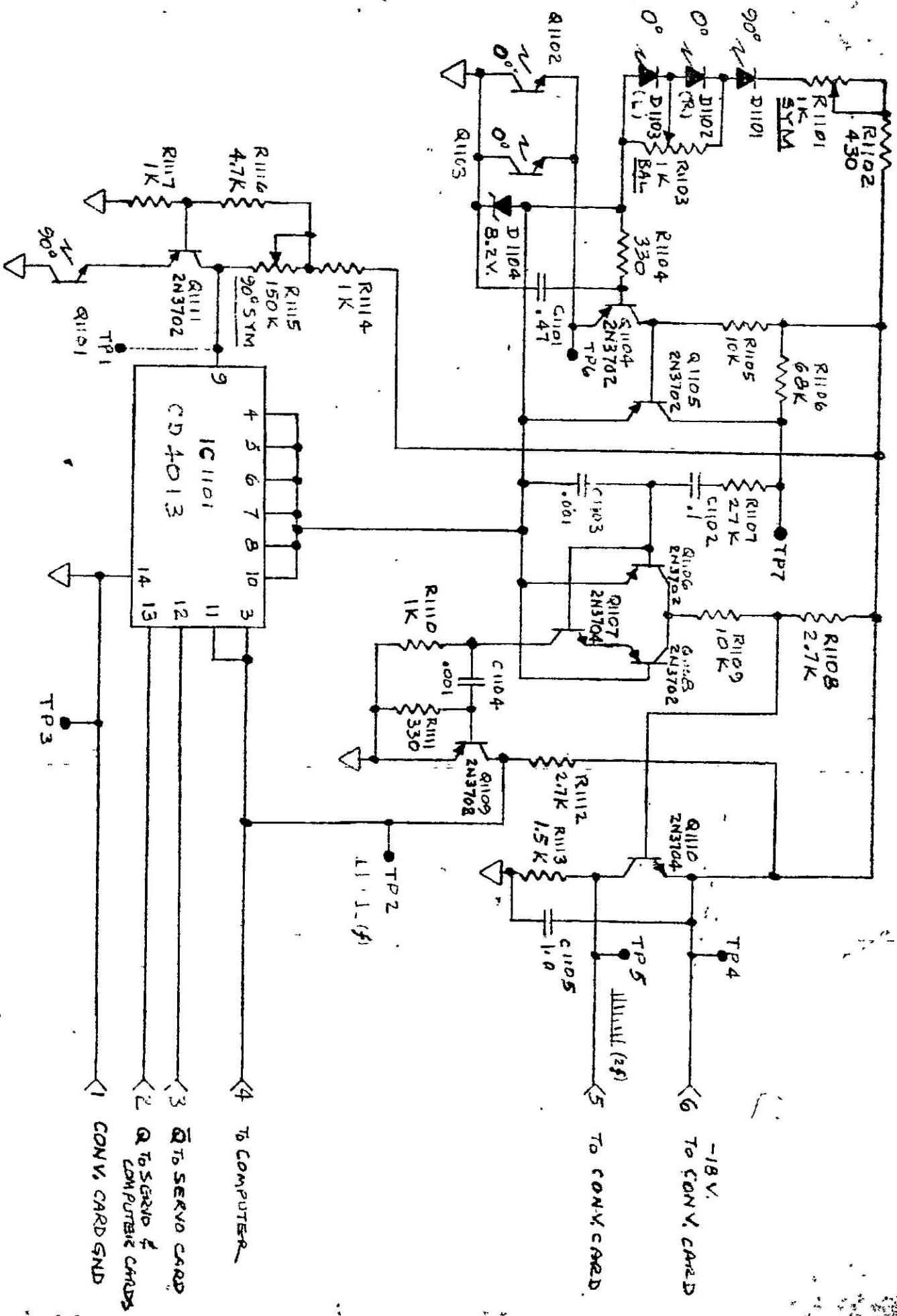
DRAWING NUMBER 310163

Servo Card
 with anti-hunt
 modification
 April 6, 1977

INDI. DIODE
 ON 19H. DECT

$+1.524 = -16.07$
 $-1.42 = -12.75$
 $-1.365 = -9.53$





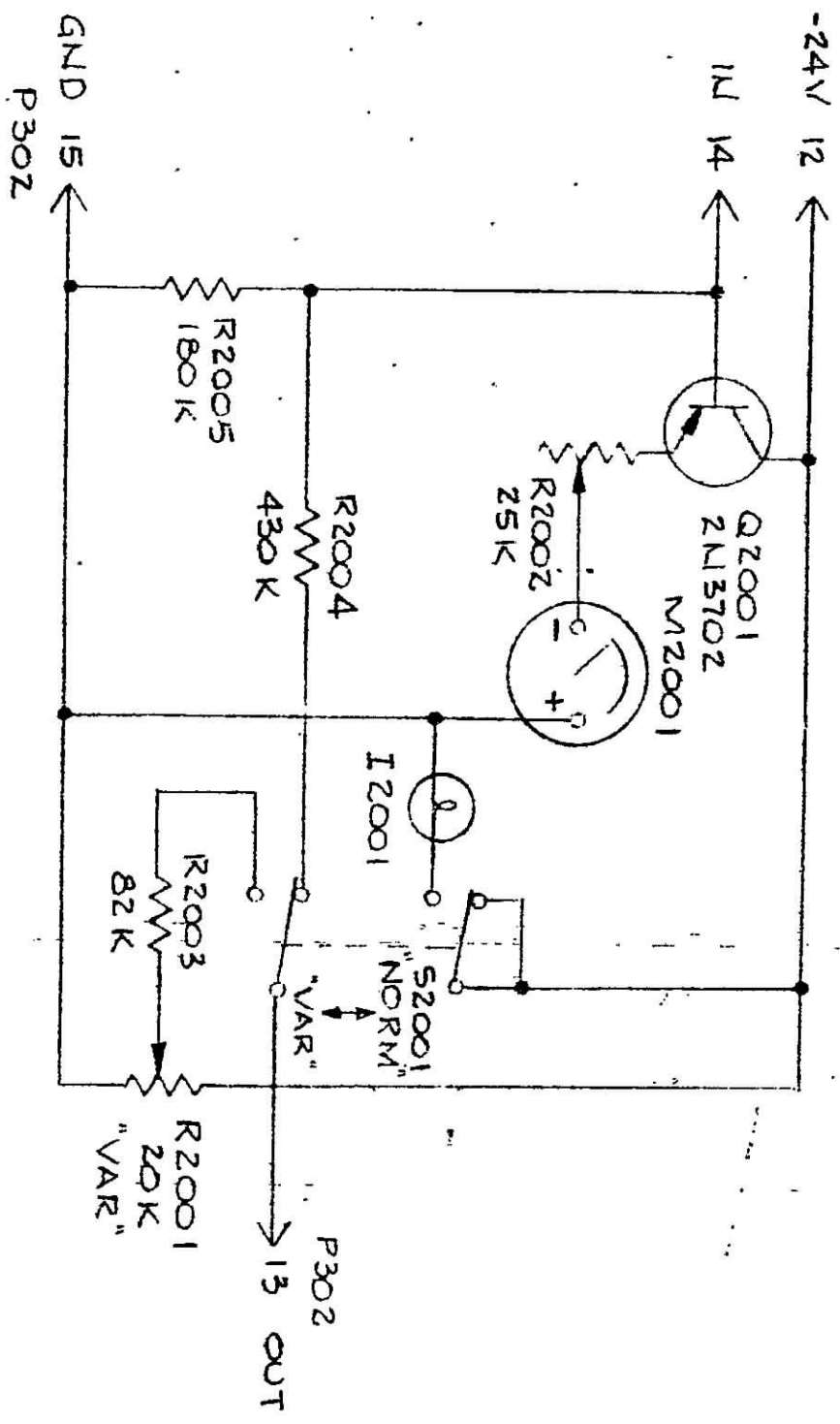
SCHEMATIC, SENSOR INTERFACE CARD AND SENSORS

FIGURE 6-10

SC-1101

6/18/79 PB
 ADDED FIG. 7/30/79 RB

| REVISIONS | | | |
|-----------|-------------|------|----|
| LTR | DESCRIPTION | DATE | BY |
| | | | |



2N3702
BOTTOM VIEW

FIGURE 6-17

STEPHENS ELECTRONICS, INC.

VSO MODULE

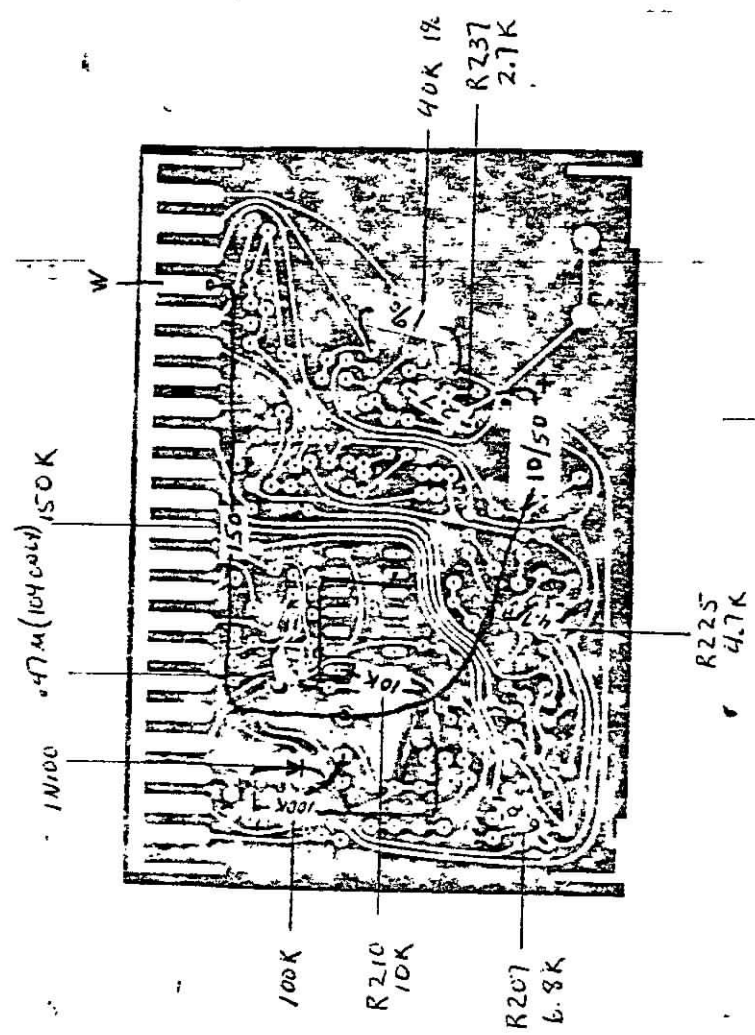
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|-----------------|---------------------------------|------------------|
| SCALE: 1 | APPROVED BY: <i>[Signature]</i> | DRAWN BY: GELIER |
| DATE: 24 SEP 79 | | REVIEWED |

| | | |
|-------------|-------------|------------------------|
| MODEL 821-B | FIGURE 6-17 | DRAWING NUMBER SC-2001 |
|-------------|-------------|------------------------|

5/17/76

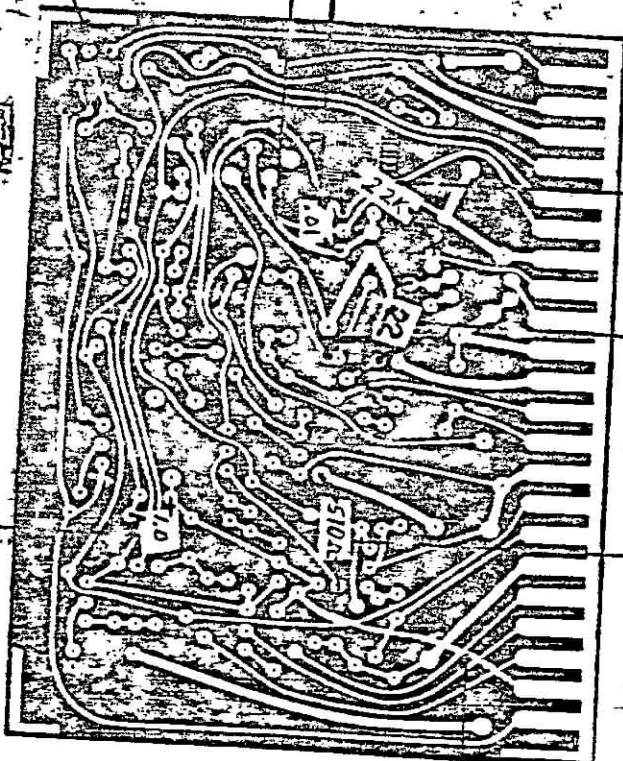
103-104

#310164



103- NO 47M CAP

104- ADD 47M CAP



R119
22K

22K

R138
510K

C102.014
JUMPER

ON 10-1
ADD. IN10P

C112
10K

JUMPER

811D-105

811D-16 TAPE SYSTEM SEL SYNC PA

| SJ10 | SJ11 | SJ12 | SJ13 | SJ14 | SJR | SWITCH | CKT |
|------|------|------|------|------|------|--------|-------|
| | | | | | B 16 | | SS 1 |
| | | | | | D 16 | | SS 2 |
| | | | | | F 16 | | SS 3 |
| | | | | | H 16 | | SS 4 |
| | | | | | A 17 | | SS 5 |
| | | | | | C 17 | | SS 6 |
| | | | | | E 17 | | SS 7 |
| | | | | | G 17 | | SS 8 |
| | | | | | B 18 | | SS 9 |
| | | | | | D 18 | | SS 10 |
| | | | | | F 18 | | SS 11 |
| | | | | | H 18 | | SS 12 |
| | | | | | A 19 | | SS 13 |
| | | | | | C 19 | | SS 14 |
| | | | | | E 19 | | SS 15 |
| | | | | | G 19 | | SS 16 |
| | | | | | B 20 | | RR 1 |
| | | | | | D 20 | | RR 2 |
| | | | | | F 20 | | RR 3 |
| | | | | | H 20 | | RR 4 |
| | | | | | A 21 | | RR 5 |
| | | | | | C 21 | | RR 6 |
| | | | | | E 21 | | RR 7 |
| | | | | | G 21 | | RR 8 |
| | | | | | B 22 | | RR 9 |
| | | | | | D 22 | | RR 10 |
| | | | | | F 22 | | RR 11 |
| | | | | | H 22 | | RR 12 |
| | | | | | A 23 | | RR 13 |
| | | | | | C 23 | | RR 14 |
| | | | | | E 23 | | RR 15 |
| | | | | | G 23 | | RR 16 |
| | | | 26 | | | | 1 |
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| | | | | 100 | | | 75 |

COLOR CODE

STRIPPED

(POLBY) COLOR CODE

SYNC BUSS

(3-4-76) 34

F 24 W/uo REA BUSS

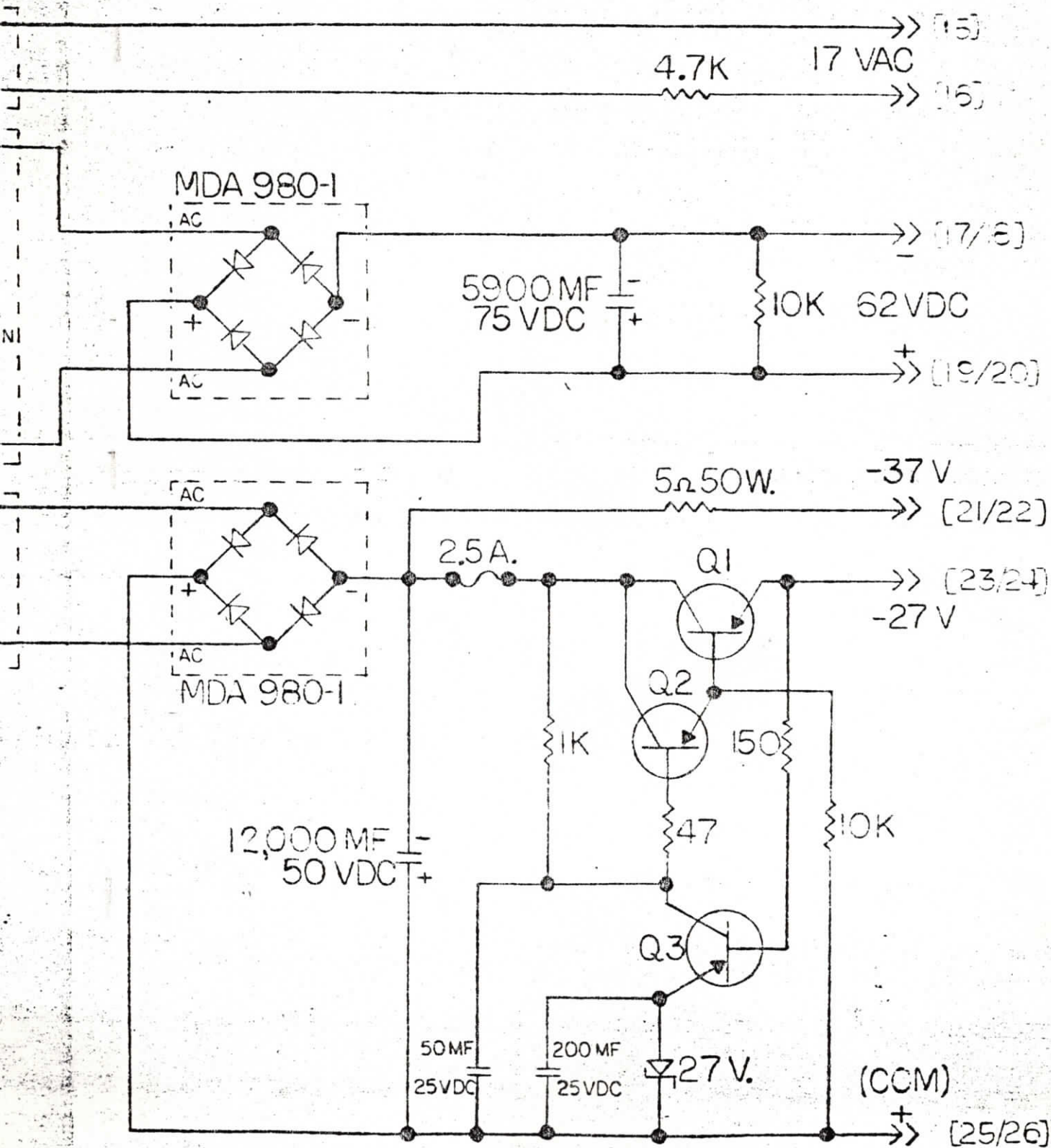
B 26 W/blk

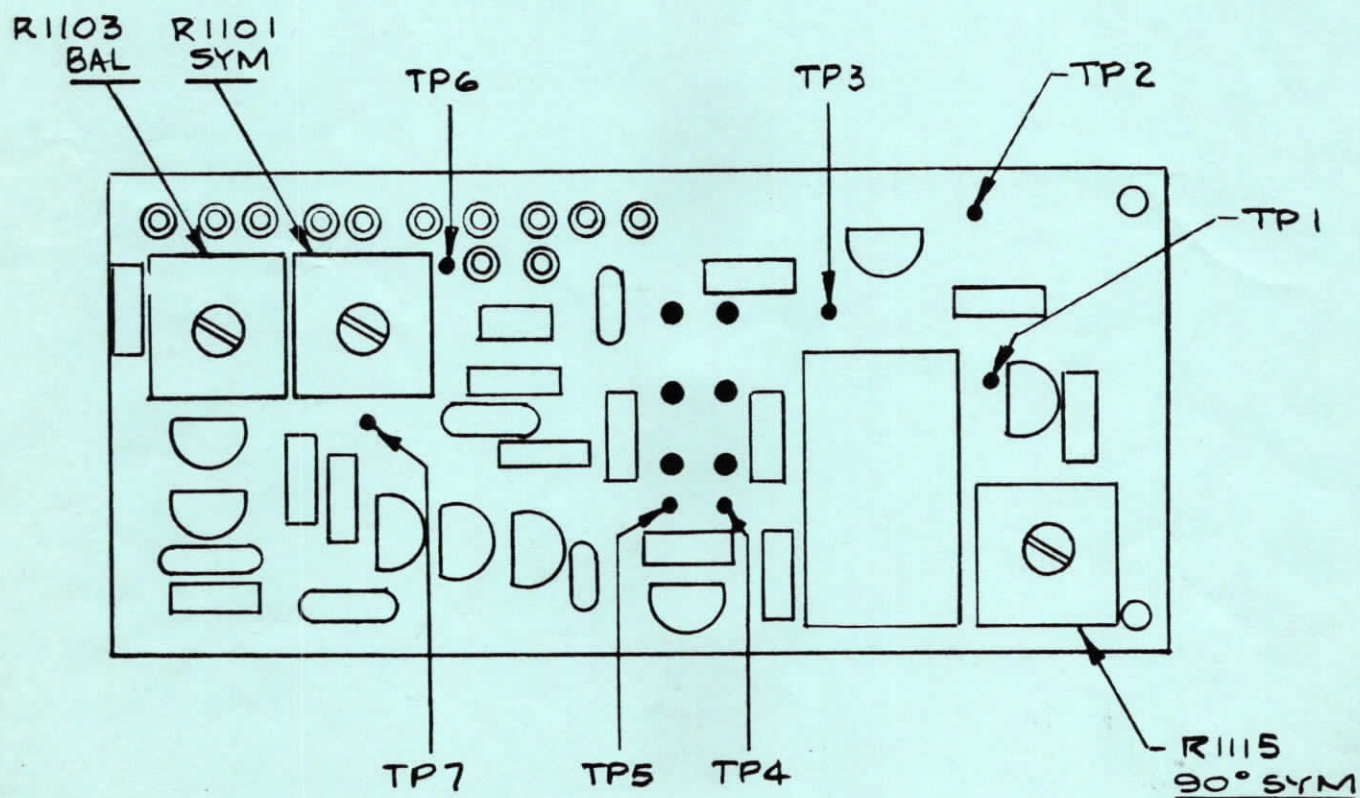
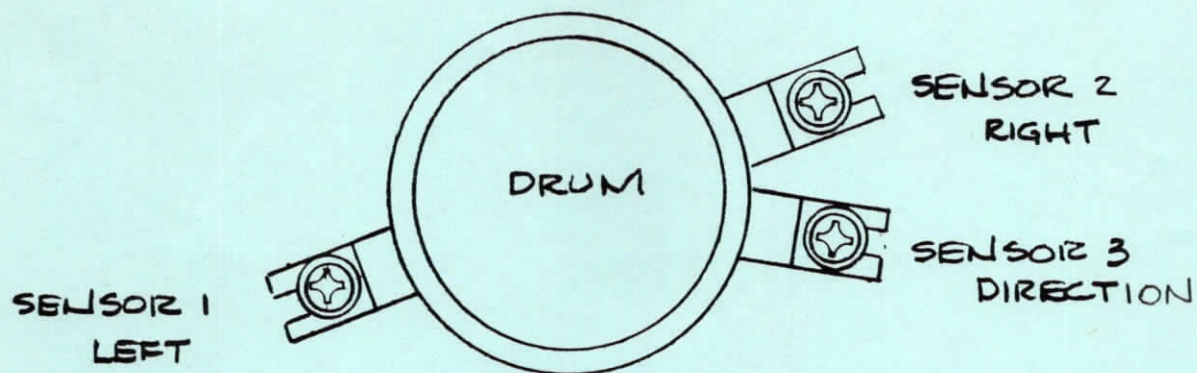
B 24 W/yel

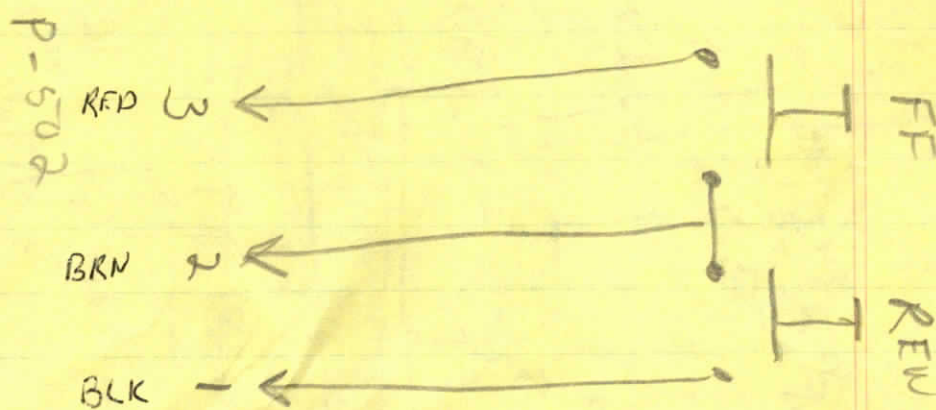
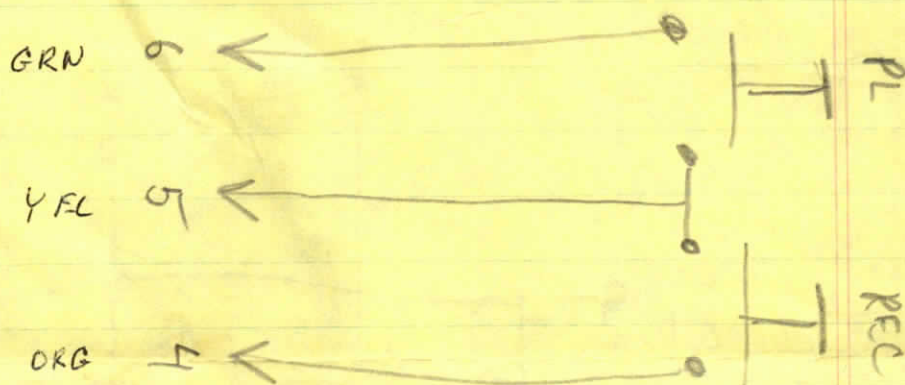
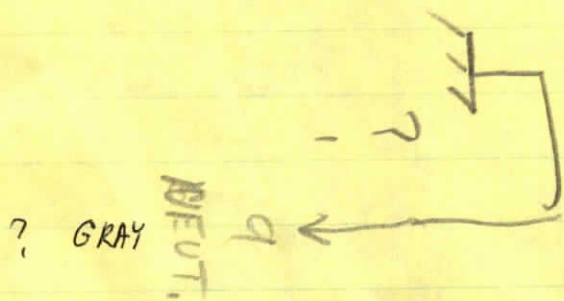
D 24 W/green

F 24 W/pink

TAPE MACHINE POWER SUPPLY SCHEMATIC







TIC-45

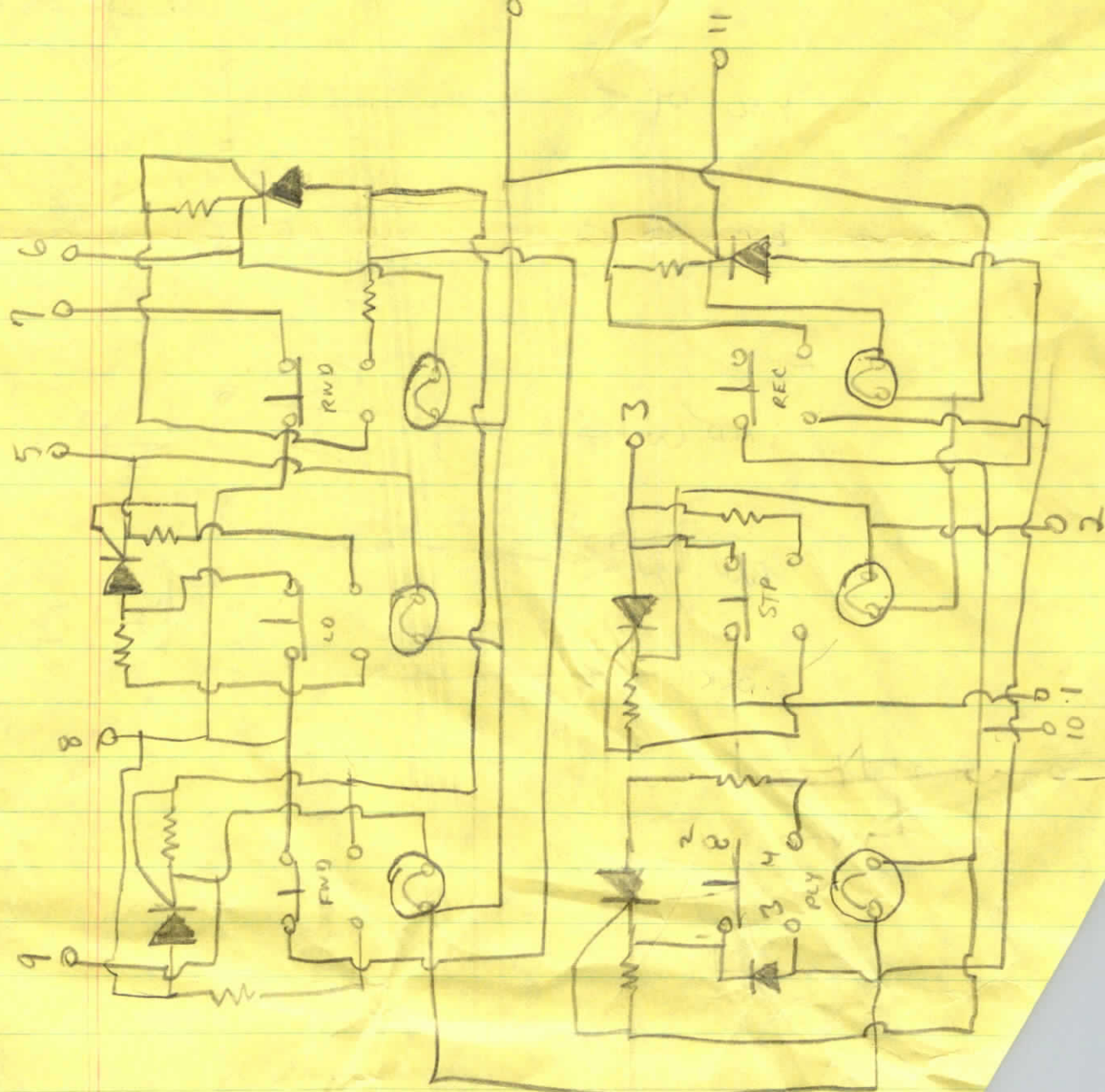
ALL REST,

150 Ω

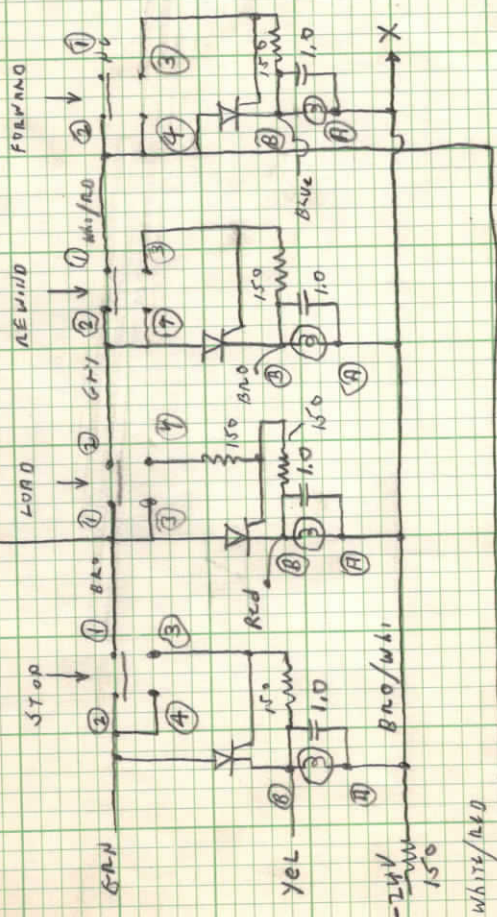
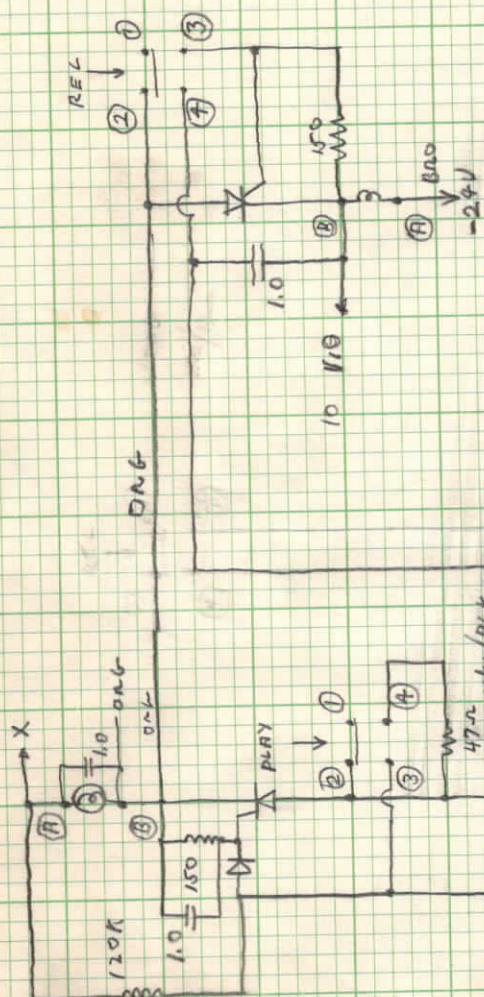
1N4001

OLD NUMBERS

4 - 27V LITE BUSS



REMOTE AS OF 12-1-85



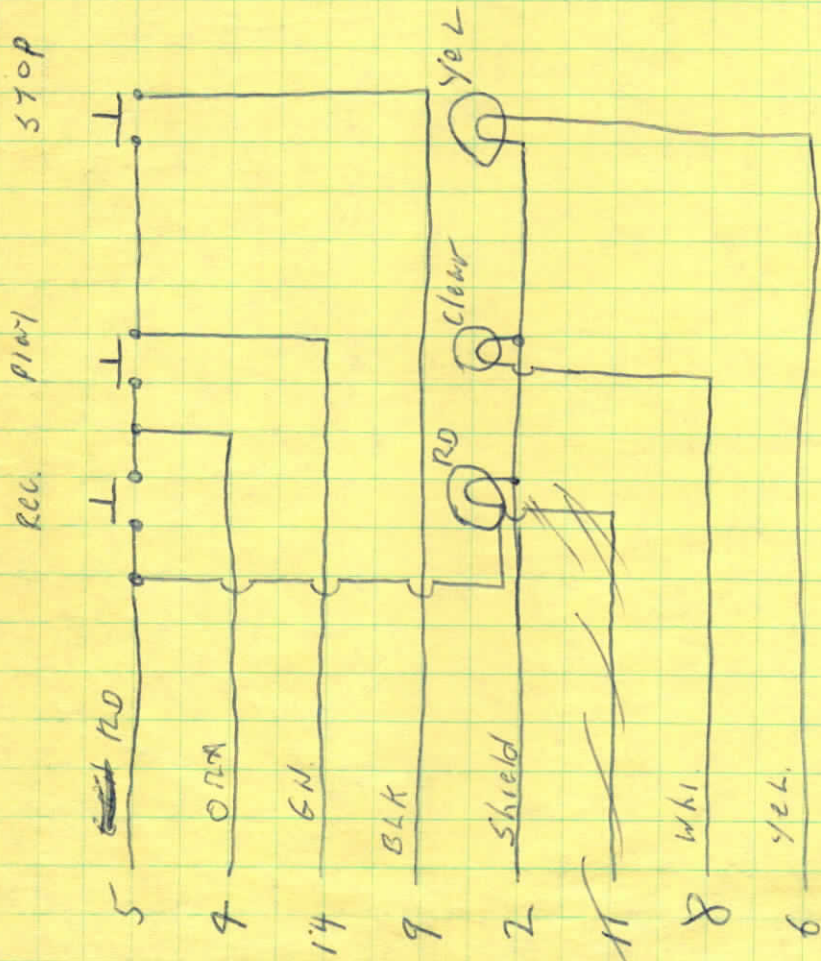
50MIN

6

50MIN

4

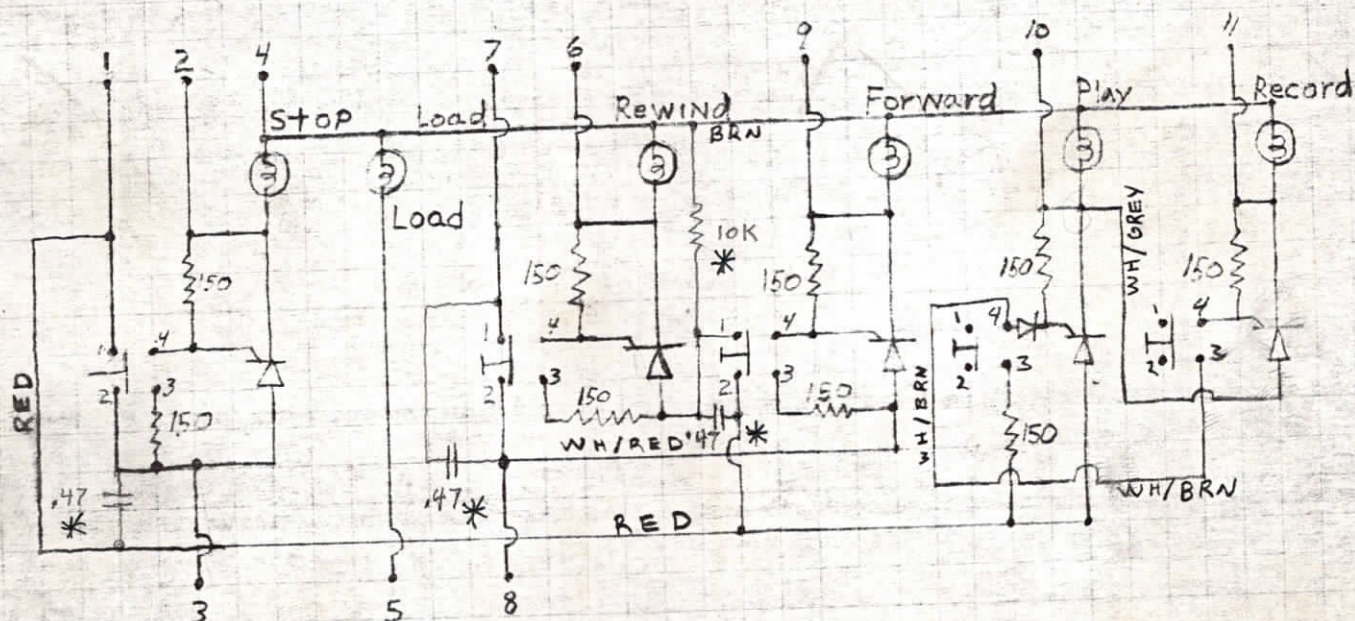
REMOTE CONTROL OF LATH ROOM TAPE DECK. 12-17-69



36 Pin Connector

Remote Shuttle Control for the 103-104 Deck Series

* 5.2 4.9 7 - INSTALLED .47/50V. CAPS ACROSS INTERLOCK CONTACTS. (3)
CONTACT CLEANERS + 10K RES PULLUP (1)



Numbered connections are pin numbers on blue Amphenol connector
#57-40360 on inside of Reardeck Panel

CABLE: #1181/20
RICHEY ELECTRONICS

| CONNECTOR PIN# | WIRE COLOR |
|----------------|------------|
| 1 | BROWN |
| 2 | RED |
| 3 | ORANGE |
| 4 | YELLOW |
| 5 | GREEN |
| 6 | BLUE |
| 7 | VIOLET |
| 8 | GREY |
| 9 | WHITE |
| 10 | BLACK |
| 11 | WH/YELLOW |
| B- 21 | WH/BLUE |
| Y 22 | WH/RED |
| X 23 | WH/GREEN |
| Δ 24 | WH/BLACK |

CONNECTOR JUMPERS

27-29
31-32

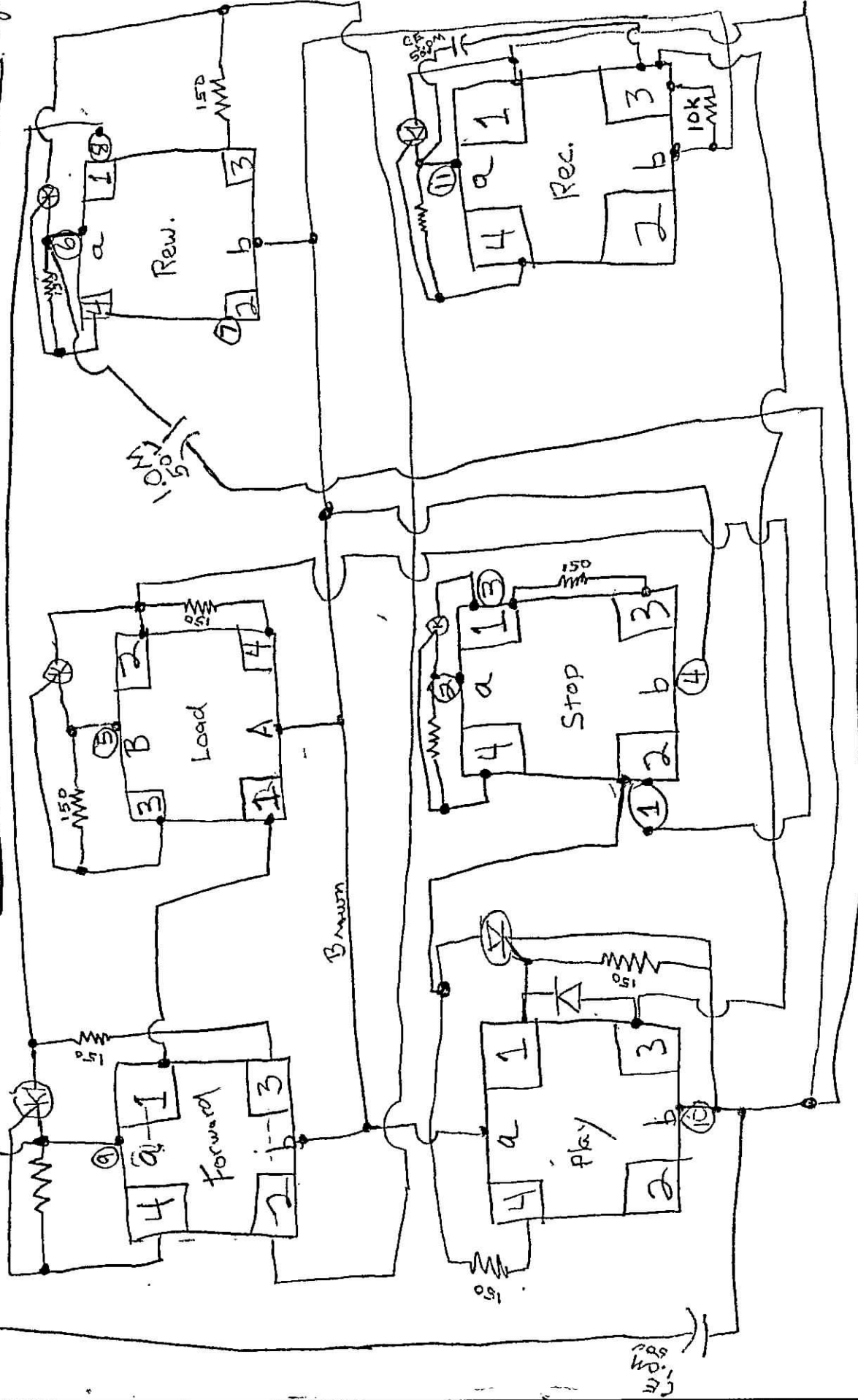
SCR'S ARE TIC 45
DIODE IS TS1
RESISTORS: 150Ω 1/4 WT.

Drawn by R. Wolfington

10-14-74

Stephens Remote

received per observation 12.16.87. by Kanapattu



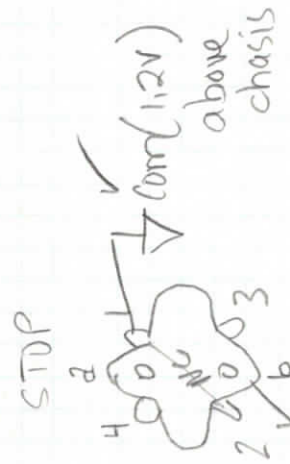
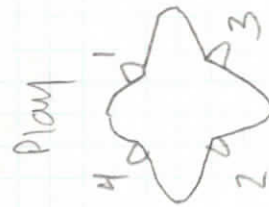
Differences from Stephens' sig. scheme may be due to Spot-Erase or Rolling Punch Out mechanism.

may be able to spot some
all SCR (function?) = T1C45
(T17320(3))

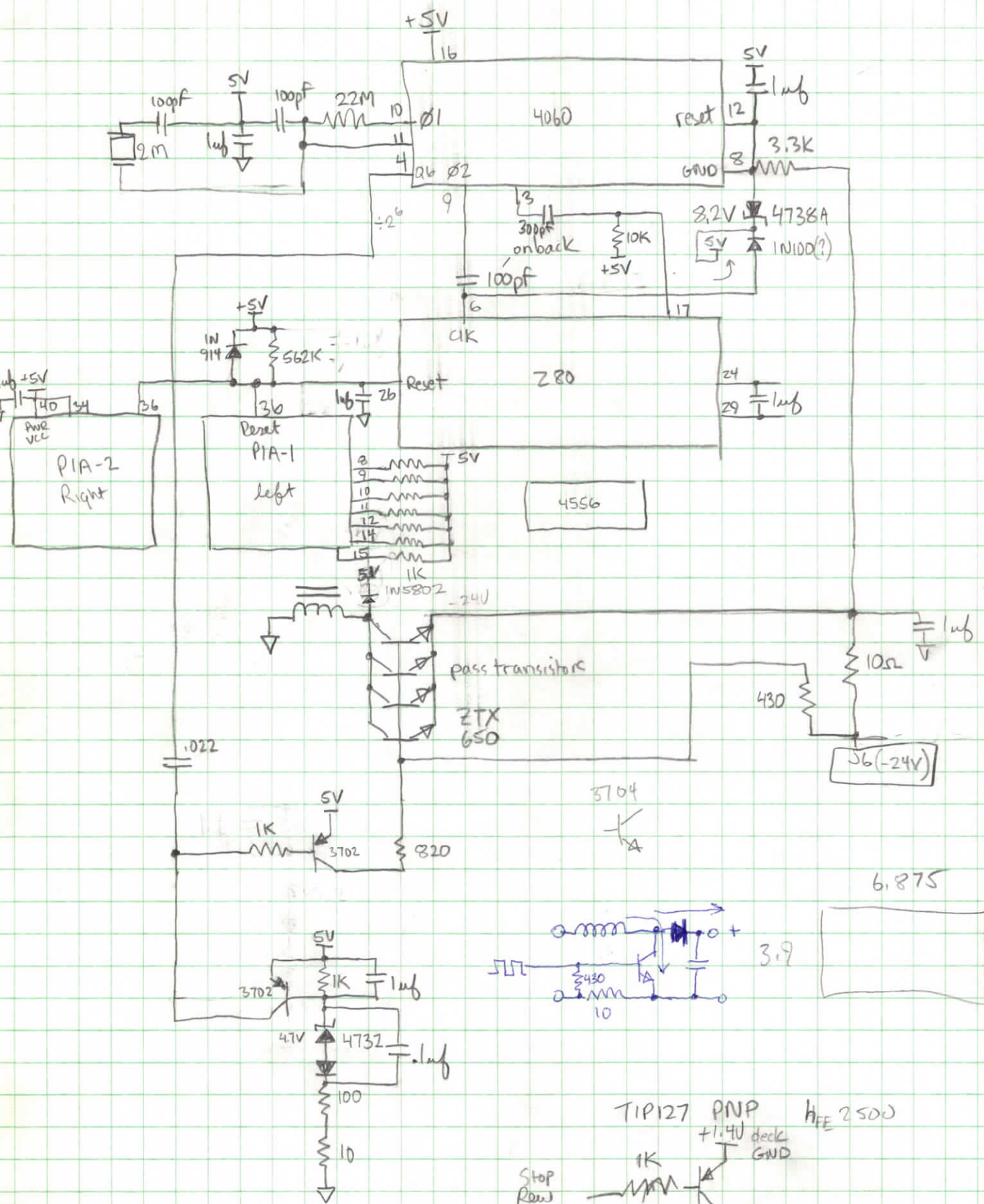
Load switch laid out in schematic the reverse of physical layout - wires in matrix. J solder switches

All resistors 150 Ω except R223 = 10k Ω

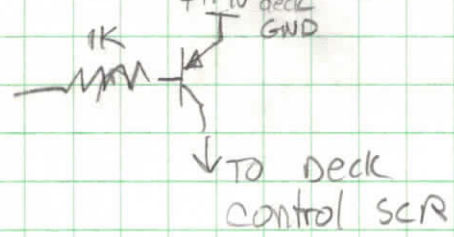
Remote
Back View

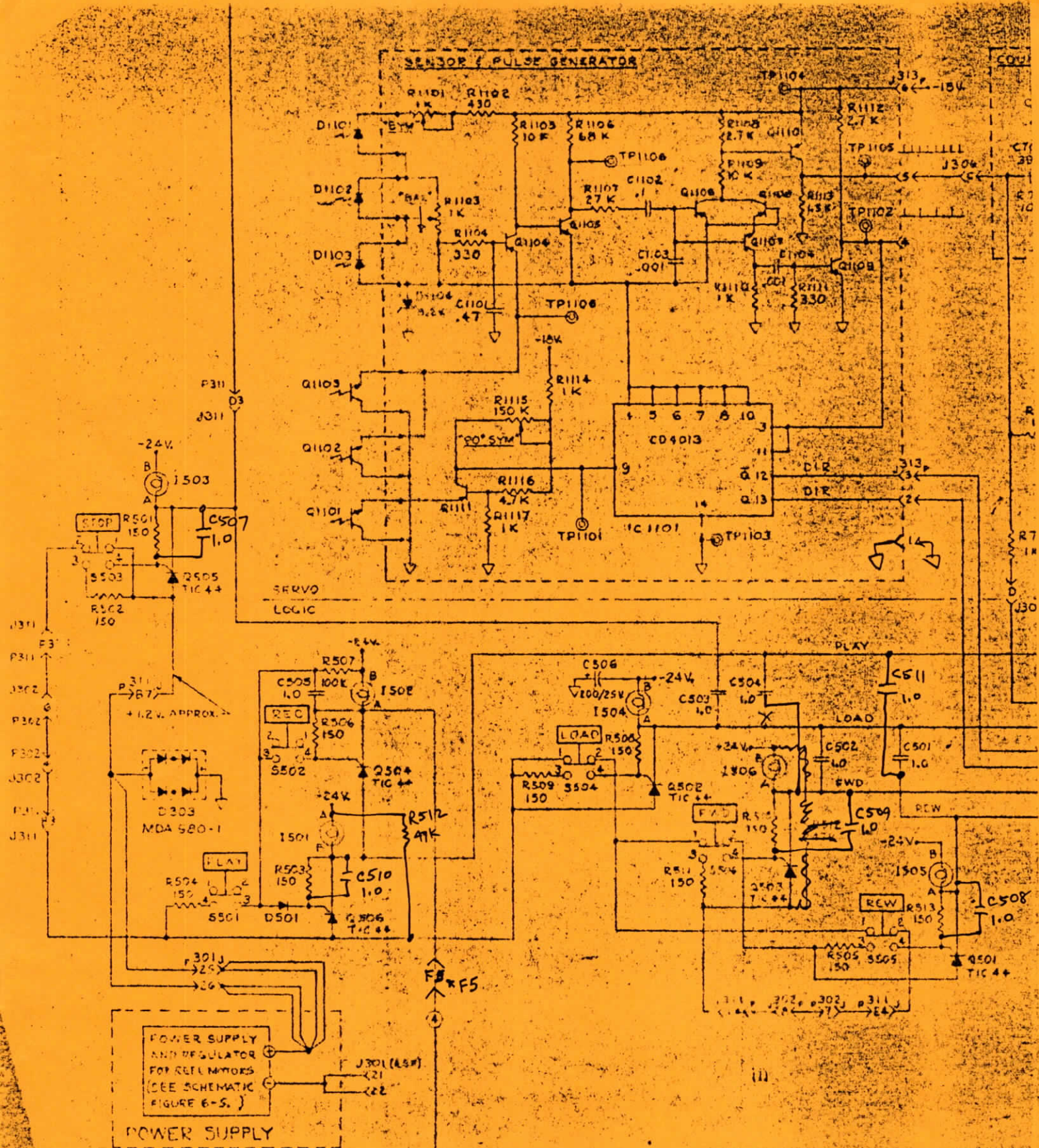


Run 2 play



TIP127 PNP $h_{FE} 2500$





- TEST 1. DIODES ARE 1N100 UNLESS NOTED OTHERWISE.
- TEST 2. TRANSISTORS SHOWN ARE 2N3702 UNLESS NOTED OTHERWISE.
- TEST 3. TRANSISTORS SHOWN ARE 2N3704 UNLESS NOTED OTHERWISE.

96

(TURNS ON BIAS OSC) BIAS OSC

STEPHENS REMOTE CONTROL "Y" ADAPTER CABLE COLOR CODE

2EA 57-40360

36 CONTACT "BLUERIBBON" CONV.
BASE COLOR / STRIPE

57-30360

| | | BASE COLOR / STRIPE | |
|----|----|---------------------|----|
| 1 | 19 | BLU / WHT | 26 |
| 2 | 20 | ORG / WHT | 27 |
| 3 | 21 | GRN / WHT | 28 |
| 4 | 22 | BRN / WHT | 29 |
| 5 | 23 | GRA / WHT | 30 |
| 6 | 24 | BLU / RED | 31 |
| 7 | 25 | ORG / RED | 32 |
| 8 | 26 | GRN / RED | 33 |
| 9 | 27 | BRN / RED | 34 |
| 10 | 28 | GRA / RED | 35 |
| 11 | 29 | BLU / BLK | 36 |
| 12 | 30 | ORG / BLK | 37 |
| 13 | 31 | GRN / BLK | 38 |
| 14 | 32 | BRN / BLK | 39 |
| 15 | 33 | GRA / BLK | 40 |
| 16 | 34 | BLU / YEL | 41 |
| 17 | 35 | ORG / YEL | 42 |
| 18 | 36 | GRN / YEL | 43 |

| | | | |
|----|----|-----------|----|
| 19 | 37 | BRN / YEL | 44 |
| 20 | 38 | GRA / YEL | 45 |
| 21 | 39 | BLU / VIO | 46 |
| 22 | 40 | ORG / VIO | 47 |
| 23 | 41 | GRN / VIO | 48 |
| 24 | 42 | BRN / VIO | 49 |
| 25 | 43 | GRA / VIO | 50 |

(REF.)
50 CONTACT 57-X0500

AMPHENAL 57-30360 CONNECTOR

- | | |
|----------------------|---------------|
| 1 | BROWN |
| 2 | RED |
| 3 | ORANGE |
| 4 | YELLOW |
| 5 | GREEN |
| 6 | BLUE |
| 7 | VIOLET |
| 8 | GREY |
| 9 | WHITE |
| 10 | BLACK |
| 11 | W/YELLOW |
| 18 | W/VIOLET |
| 21 | W/BLUE |
| 22 | W/RED |
| 23 | W/GREEN |
| 24 | W/BLACK |
| 27-29 | JUMPER |
| 31-32 | JUMPER |
| 12-17 19-20-25-26-28 | NO CONNECTION |

SWITCHES

VSO

NOTES

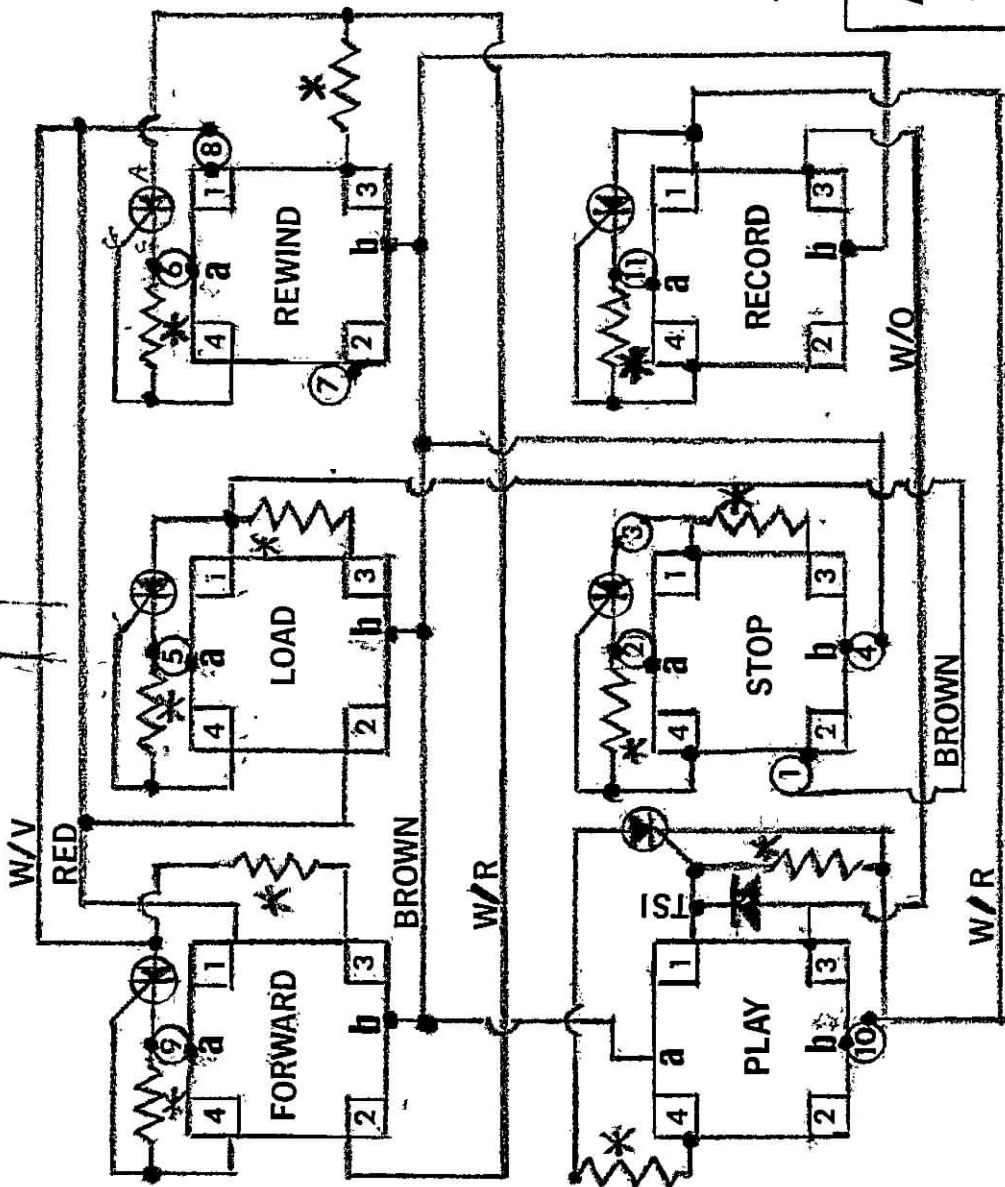
SCHEMATIC

ALL SCR - TIC 45

150 Ω - *

SWITCH - 1 2

3 4



REMOTE SHUTTLE

APPROVED BY:

SCALE:

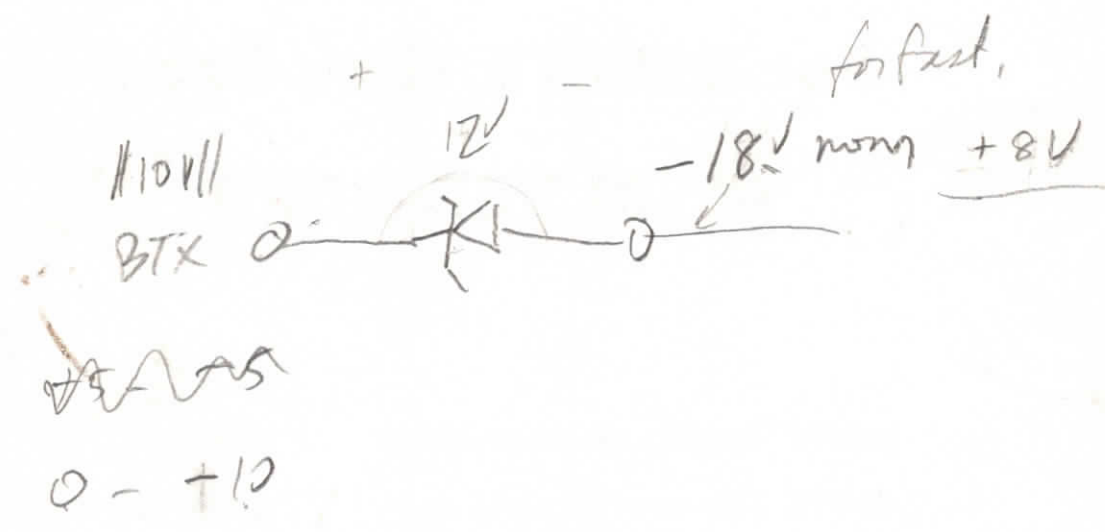
DATE: 10-12-77

DRAWN BY: KJANAL

REVISED

DRAWING NUMBER

21500014



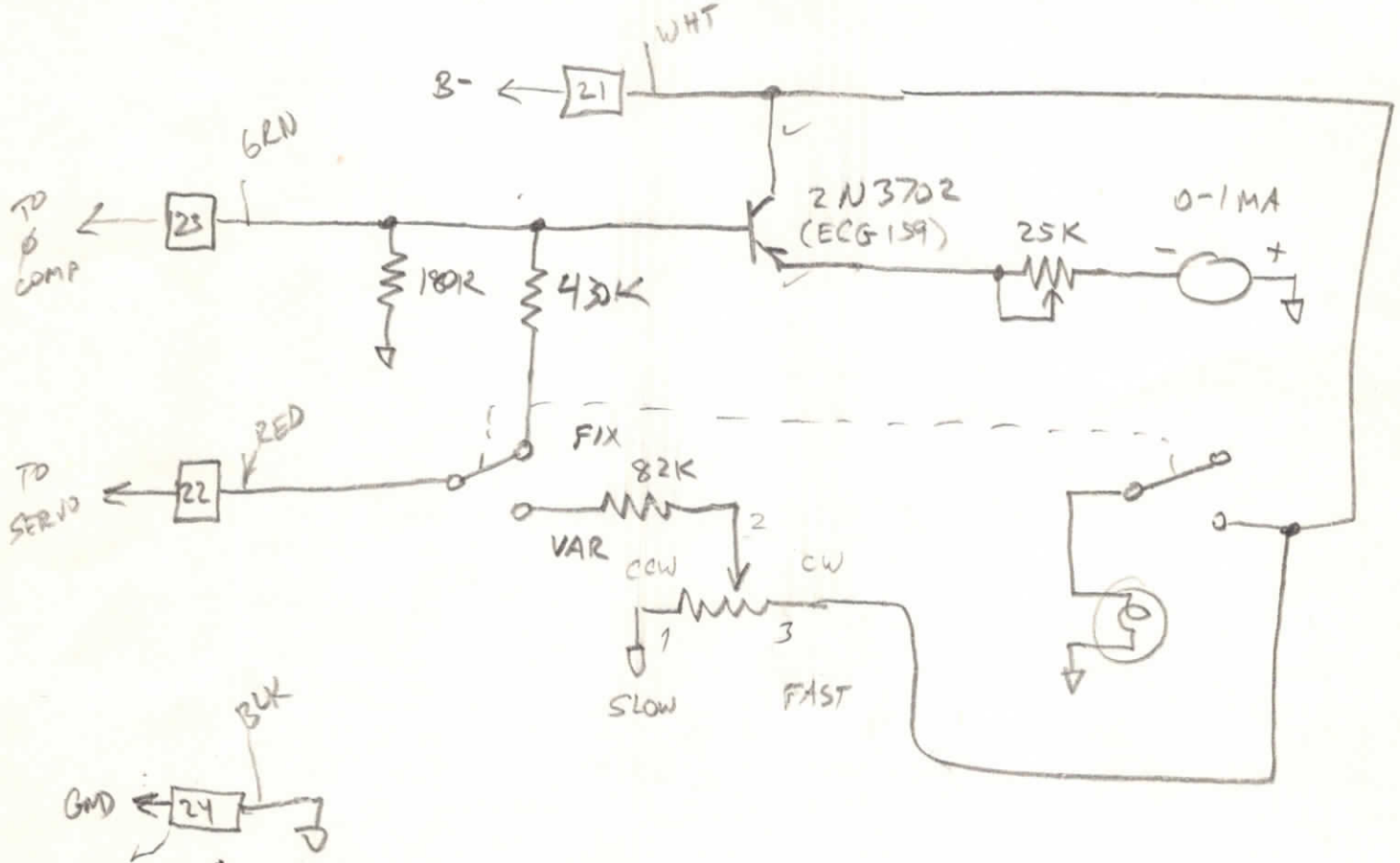
7/7/81 BB



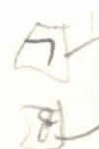
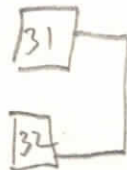
RECORDING SERVICES COMPANY

RSC

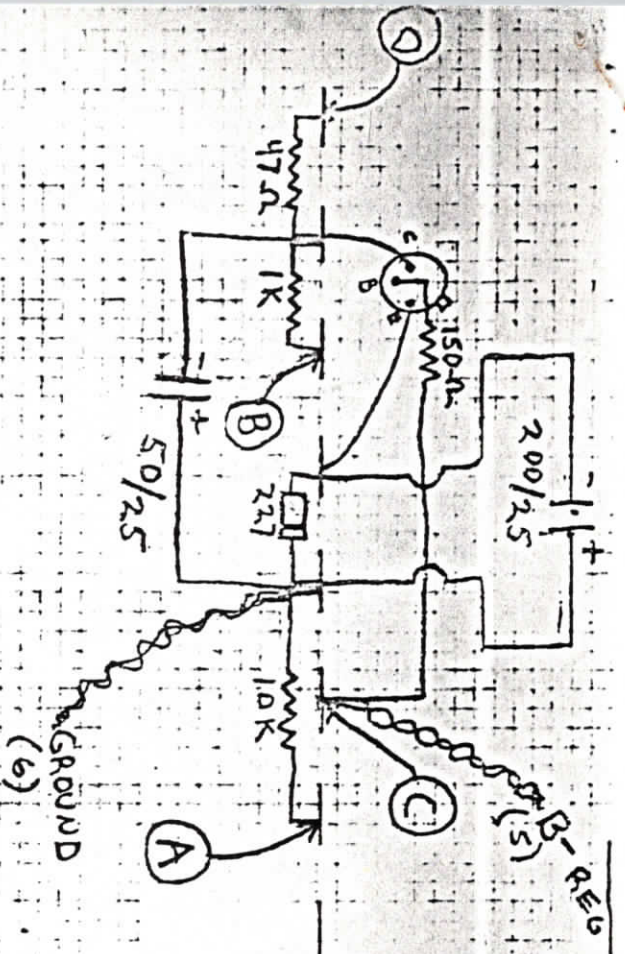
811 D SPARE VSO BOX



also! Jumpers:



Amphenol Blue Ribbon
P/N 57-30360

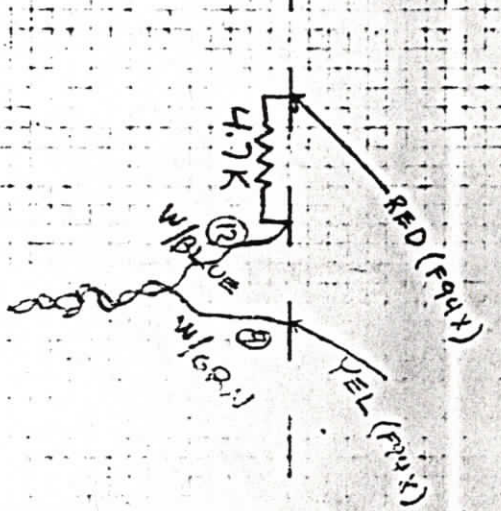


SMALL HEAT SINK SOCKET CONNECTIONS

- Q1-B + Q2-E VIO TO (A)
- Q1-C + Q2-C GRN TO (B)
- Q1-E YEL TO (C)
- Q1-B ORNG TO (D)

TR02

REGULATOR CIRCUIT (ON TERMINAL STRIP)



REPRESENTS POWER SUPPLY CABLE CONNECTIONS


UJ20013

POWER SUPPLY CABLE

POWER SUPPLY (ALL DECKS)

222-11N31 A'PHENOL CONNECTOR (FEMALE)

(CUT CABLE LENGTH TO 6', 8" PEEL POWER SUPPLY END ABOUT 10" AND CONNECTOR END 1.05")

| DRAWING REF. # | PIN # | CABLE WIRE COLOR | POWER SUPPLY LOCATION |
|-------------------|----------|--------------------|--|
| | 1 | BROWN |  MOTOR TRANSISTORS |
| | 2 | RED | |
| | 3 | ORANGE | |
| | 4 | YELLOW | |
| | 5 | GREEN | |
| | 6 | BLUE | |
| | 7 | VIOLET | |
| | 8 | GREY | |
| | 9 | BLACK | |
| | 10 | WHITE/BLACK | |
| 7 | 11 | WHITE/BROWN | POWER (3) |
| | 12 | WHITE/RED | |
| 5 | 13 | WHITE/ORANGE | POWER (4) |
| | 14 | WHITE/YELLOW | |
| 9 | 15 | WHITE/GREEN | YELLOW 4.7K |
| 13 | 16 | WHITE/BLUE | |
| 17 | 17 | WHITE/VIOLET | JP11 + |
| | 18 | WHITE/BLACK | |
| 19 | 19 | WHITE/BROWN/RED | JP12 - |
| | 20 | WHITE/BROWN/ORANGE | |
| 4 | 21 | WHITE/BLACK/BROWN | 5 OHMS 50 W OHM |
| | 22 | WHITE/BLACK/RED | |
| 5 | 23 | WHITE/BLACK/ORANGE | 27 V.D.C. DECK B - B - REGULATED |
| | 24 | WHITE/BLACK/YELLOW | |
| 6 | 25 | WHITE/BLACK/GREEN | GROUND |
| | 26 | WHITE/BLACK/BLUE | |
| | 27 | WHITE/BLACK/VIOLET | NO CONNECTIONS |
| | 28 | WHITE/BLACK/BLACK | |
| | 29 | WHITE/BROWN/YELLOW | |
| | 30 | WHITE/BROWN/GREEN | |

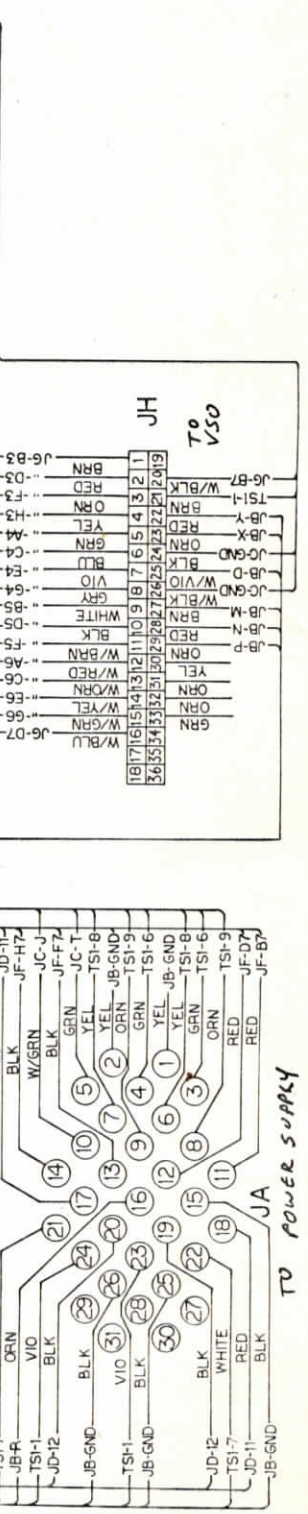
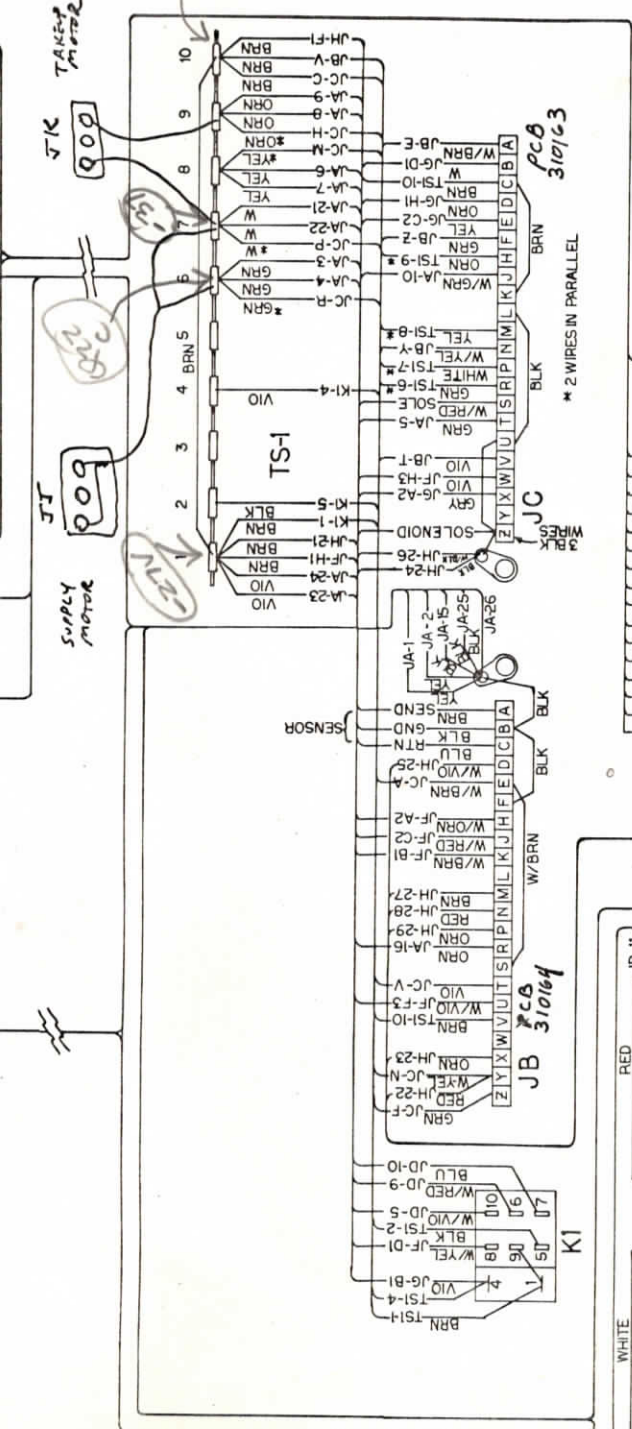
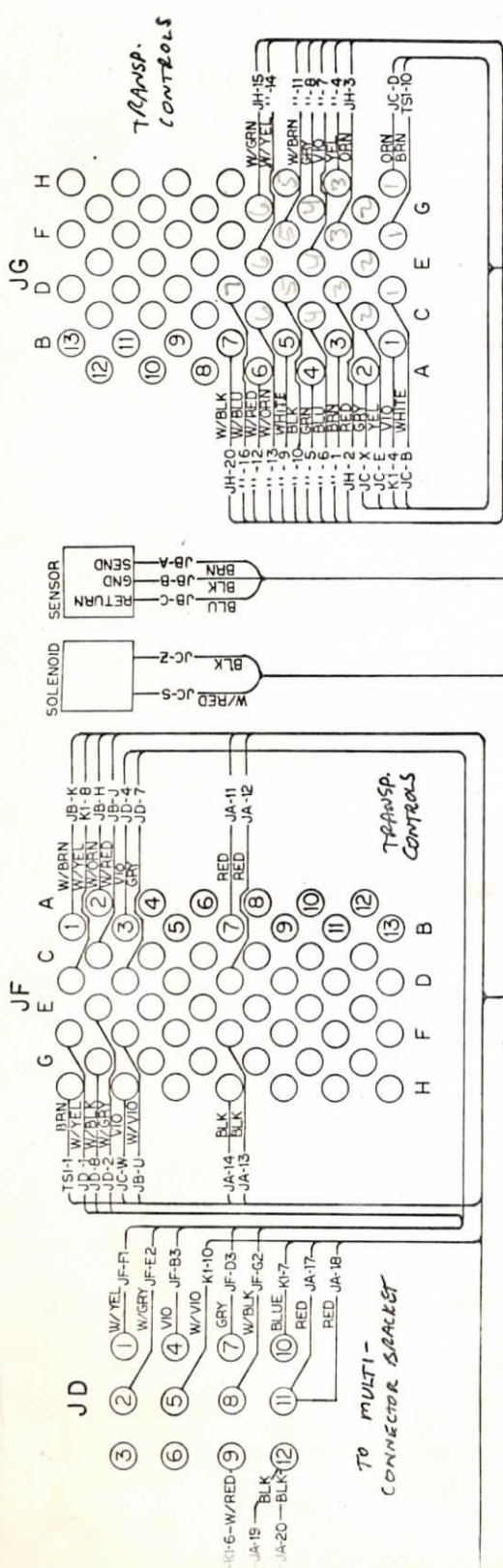
MOTOR
TRANSISTORS

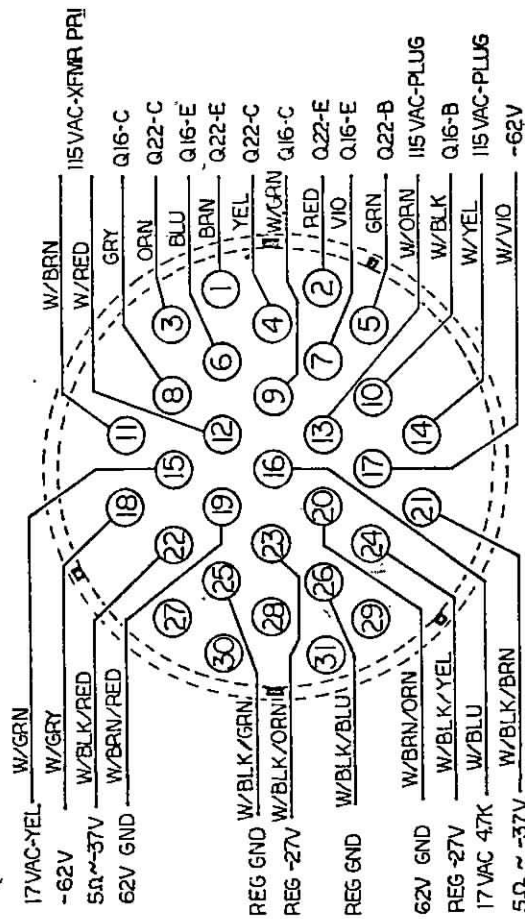
17VAC (60CY SOURCE)
F94X (DO NOT TWIST AT ENDS ONLY)

+ 60VDC. TO REGULATOR
ON BIAS SUPPLY
F681 or F92A 5V- AUDIO AMP.
(REGULATED TO 48V.)

MOTOR COMMON

27 V.D.C. DECK B -
B - REGULATED
F20411 or
RT 204



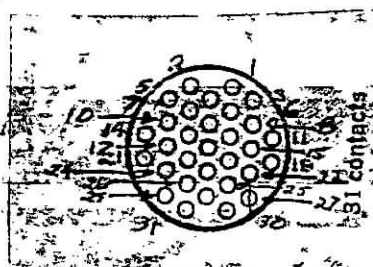


PA

Power Supply Cable

- 1 Brown } E, Q22 Power Supply 16/24/48
 2 Red }
 3 Orange } C, Q22
 4 Yellow }
 5 Green } B, Q22
 6 Blue } E, Q16
 7 Violet }
 8 Grey } C, Q16
 9 Black }
 10 white / Blk B, Q16
 11 white / Brown } Power (3)
 12 white / Red }
 13 white / Orange } Power (4)
 14 white / yellow }
 15 white / Green } Yellow } F94X } 60 ~~Hz~~ Ac @ 27VAC
 16 white / Blue } 4.7K
 17 white / Violet } JD11 +
 18 white / Grey }
 19 white / Brown / Red } JD12 } F684
 20 white / Brown / orange } or F927
 21 white / Blk / Brown }
 22 white / Blk / Red } 5r 50w out
 23 white / Blk / orange } B - Regulated
 24 white / Blk / yellow }
 25 white / Blk / Green } Gnd } F2044
 26 white / Blk / Blue }
 27 white / Black / via }
 28 white / Black / Grey } no connections
 29 white / Brown / yellow }
 30 white / Brown / Green }
 31

(cut cable length)
 to left, inches.
 (Peel P.S. end about 1/4 inches)



This is a front view

LEMA copy

POWER SUPPLY 16/24/40

Cable Female
222-11N31 AMPHENOL CONNECTOR (FEMALE)

(CUT CABLE LENGTH TO 6 FT. 8 INCHES
PEEL P.S. END ABOUT 10 INCHES)

REMOTE
CONTROL

1 BROWN } E,Q22
2 RED }

3 ORANGE } C,Q22
4 YELLOW }

5 GREEN B,Q22

6 BLUE } E,Q16
7 VIOLET }

8 GREY } C,Q16
9 BLACK }

10 WHITE/BLACK B,Q16

11 WHITE/BROWN } POWER (3)
12 WHITE/RED }

13 WHITE/ORANGE } POWER (4)
14 WHITE/YELLOW }

15 WHITE/GREEN } YELLOW } F94X
16 WHITE/BLUE } 4.7K }

27 VAC
for 60 N source

17 WHITE/VIOLET } JD11 +
18 WHITE/GREY }

F68U or
F92A

19 WHITE/BROWN/RED } JD12
20 WHITE/BROWN/ORANGE }

21 WHITE/BLACK/BROWN } 5 OHMS 50 W OUT
22 WHITE/BLACK/RED }

23 WHITE/BLACK/ORANGE } B - REGULATED } F204U
24 WHITE/BLACK/YELLOW }

25 WHITE/BLACK/GREEN } GROUND
26 WHITE/BLACK/BLUE }

27 WHITE/BLACK/VIOLET } NO CONNECTIONS
28 WHITE/BLACK/GREY }
29 WHITE/BROWN/YELLOW }
30 WHITE/BROWN/GREEN }

8/11

YELLOW

CIRCLED NUMBERS (①) ARE CABLE CONNECTIONS

TO:
FROM:
SUBJECT:



VA Connections: Power supply (Deck female)

| Locality | Altitude | Time | Observer | Notes |
|------------------|----------|-------|----------|-------|
| Q22 - B grn | 10 | 10:00 | Red | |
| Q22 - c-org #22 | 11 | 11:00 | Red | |
| Q22 - E yell #20 | 12 | 12:00 | Red | |
| Q22 - White #20 | 13 | 13:00 | Red | |
| Q22 - Violet #20 | 14 | 14:00 | Red | |
| Q22 - B | 15 | 15:00 | Red | |
| Q22 - B grn | 16 | 16:00 | Red | |
| Q22 - B grn | 17 | 17:00 | Red | |
| Q22 - B grn | 18 | 18:00 | Red | |
| Q22 - B grn | 19 | 19:00 | Red | |
| Q22 - B grn | 20 | 20:00 | Red | |
| Q22 - B grn | 21 | 21:00 | Red | |
| Q22 - B grn | 22 | 22:00 | Red | |
| Q22 - B grn | 23 | 23:00 | Red | |
| Q22 - B grn | 24 | 24:00 | Red | |
| Q22 - B grn | 25 | 25:00 | Red | |
| Q22 - B grn | 26 | 26:00 | Red | |
| Q22 - B grn | 27 | 27:00 | Red | |
| Q22 - B grn | 28 | 28:00 | Red | |
| Q22 - B grn | 29 | 29:00 | Red | |
| Q22 - B grn | 30 | 30:00 | Red | |

— 16 —
 les communications (Réimpr. Sync Box) (Female)

(3) T52N Grn #22 X(ey) Green II
T51U Red #22 W(ey) Red 8
T52D Brn - B-
T51G Whi #20 B-
T51V TSI V

9
104
12

SD Connections (Electronics)

7.5 ft Front

| Pin | Color | Signal |
|-----|---------|---------|
| 1 | wh/yell | F1 Left |
| 2 | SD4 | |
| 3 | | |
| 4 | Uio | |
| 5 | RyA10 | |
| 6 | | |

7.5 ft Front

| Pin | Color | Signal |
|-----|---------|--------|
| 7 | Sb4 + G | |
| 8 | SD6 | |
| 9 | RyA6 | |
| 10 | RyA7 | |
| 11 | Red | |
| 12 | Blk | |

Power supply connector on deck
 AMPH ENOL - 222-22N31 (MALE)

1 - YEL } 222E GND.
 2 - YEL }
 3 - GREEN } 222C
 4 - GREEN }
 5 - GREEN } 222B
 6 - YEL } 222E
 7 - YEL }
 8 - ORANG } 222C
 9 - ORANG }
 10 - WHT/GREY } 222B
 11 - RED }
 12 - RED }
 13 - BLK }
 14 - BLK }
 15 - BLK }
 16 - ORANG }
 17 - RED }
 18 - RED }
 19 - BLK }
 20 - BLK }
 21 - WHTE }
 22 - WHTE }
 23 - VIOLET }
 24 - VIOLET }
 25 - BLK }
 26 - BLK }

B7
 D7
 F7
 H7
 GND.

310163 - R
 310163 - T
 310163 - M
 310163 - H
 310163 - J
 LEFT SW.
 UNIT

J.C. 31

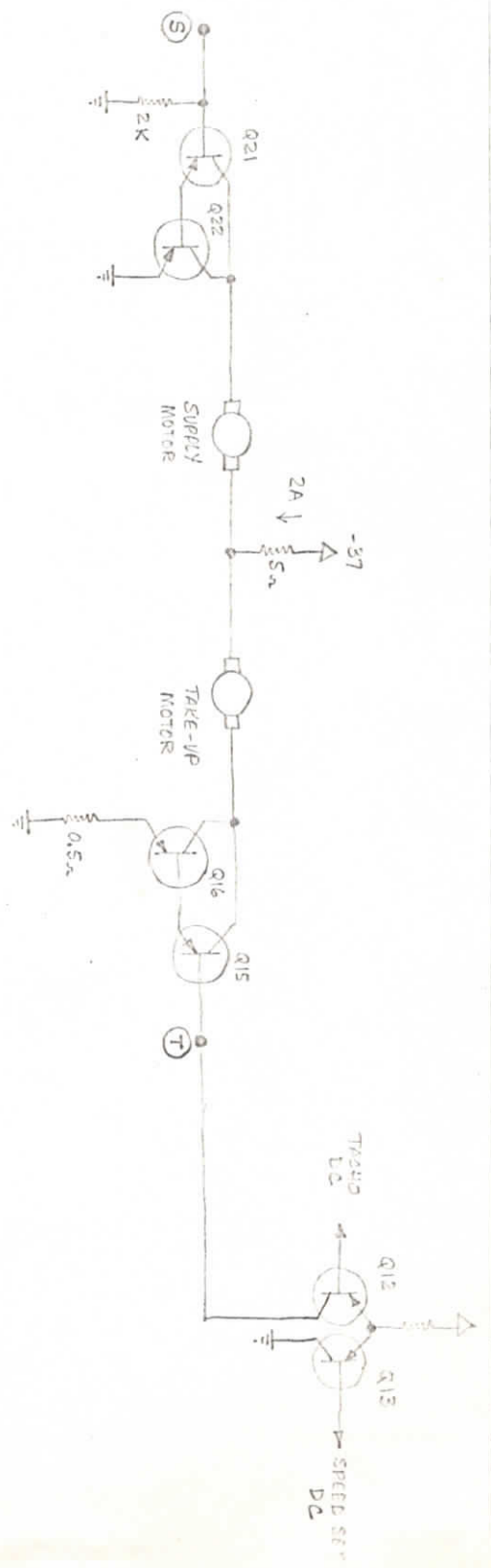
UD 12

310163 - P

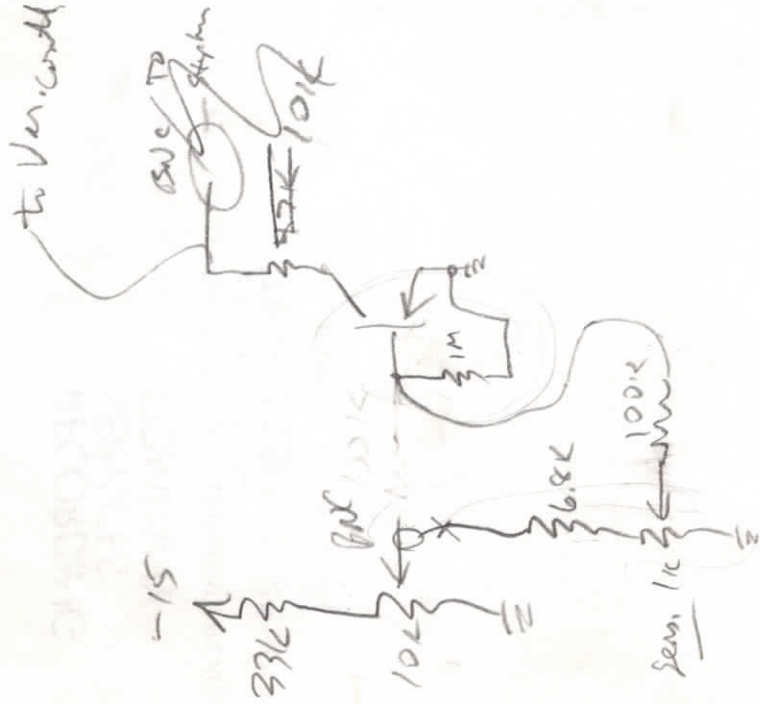
GND.

B - - 10X TERMINAL STRIP

Q16 AND Q22 ARE 2N6329
 MOUNTED ON POWER SUPPLY



SIMPLIFIED SERVO



811D
used
2/8

811D-16

811C-16 Tape System

Sel-Sync Panel 1 of 2

| SJ9 | SJ10 | SJ11 | SJ12 | SJ13 | SJ14 | Switch | CKT. |
|-----|------|------|------|------|------|--------|---------|
| H1 | | | | 35 | | | E In1 |
| E2 | | | | 36 | | | E In2 |
| D1 | | | | 37 | | | E In3 |
| B1 | | | | 38 | | | E In4 |
| | H1 | | | 39 | | | E In5 |
| | E2 | | | 40 | | | E In6 |
| | D1 | | | 41 | | | E In7 |
| | B1 | | | 42 | | | E In8 |
| | H1 | | | 35 | | | E In9 |
| | E2 | | | 36 | | | E In10 |
| | D1 | | | 37 | | | E In11 |
| | B1 | | | 38 | | | E In12 |
| | | H1 | | 39 | | | E In13 |
| | | E2 | | 40 | | | E In14 |
| | | D1 | | 41 | | | E In15 |
| | | B1 | | 42 | | | E In16 |
| | | | | | | | E Out1 |
| | | | | | | | E Out2 |
| | | | | | | | E Out3 |
| | | | | | | | E Out4 |
| | H13 | | | 43 | | | E Out5 |
| | F13 | | | 44 | | | E Out6 |
| | D13 | | | 45 | | | E Out7 |
| | B13 | | | 46 | | | E Out8 |
| | | | | 47 | | | E Out9 |
| | | | | 48 | | | E Out10 |
| | | | | 49 | | | E Out11 |
| | | | | 50 | | | E Out12 |
| | H13 | | | 43 | | | E Out13 |
| | F13 | | | 44 | | | E Out14 |
| | D13 | | | 45 | | | E Out15 |
| | B13 | | | 46 | | | E Out16 |
| | | H13 | | 47 | | | E Out17 |
| | | F13 | | 48 | | | E Out18 |
| | | D13 | | 49 | | | E Out19 |
| | | B13 | | 50 | | | E Out20 |
| | | | | | | | W/B 1 |
| | | | | | | | W/B 2 |
| | | | | | | | W/B 3 |
| | | | | | | | W/B 4 |
| | H7 | | | | | | W/B 5 |
| | E8 | | | | | | W/B 6 |
| | D7 | | | | | | W/B 7 |
| | B5 | | | | | | W/B 8 |
| | | | | | | | W/B 9 |
| | | | | | | | W/B 10 |
| | | | | | | | W/B 11 |
| | | | | | | | W/B 12 |
| | | | | | | | W/B 13 |
| | | | | | | | W/B 14 |
| | | | | | | | W/B 15 |
| | | | | | | | W/B 16 |
| | | | | | | | W/G 1 |
| | | | | | | | W/G 2 |
| | | | | | | | W/G 3 |
| | | | | | | | W/G 4 |
| | | | | | | | W/G 5 |
| | | | | | | | W/G 6 |
| | | | | | | | W/G 7 |
| | | | | | | | W/G 8 |

SJ9 Line Amp #1
(chnl 1-4)SJ10 Line Amp #2
(chnl 5-8)SJ11 Line Amp #3
(chnl 9-12)SJ12 Line Amp #4
(chnl 13-16)SJ13 Machine In-Out
Channels 1-8SJ14 Machine In-Out
Channels 9-16

← 1502 OUT

← 1502 OUT
connectors1-7-8 ARMY
811D-16

811C-16

811C-16 Tape System

Sel-Sync Panel 2 of 3

| SJ10 | SJ11 | SJ12 | SJ13 | SJ14 | SJ8 | Switch | CKT. |
|-------|-------|-------|-------|----------|-------|--------|--------|
| | G10 | | | | | 1 | W/G 9 |
| | E10 | | | | | 2 | W/G 10 |
| | C10 | | | | | 3 | W/G 11 |
| | A10 | | | | | 4 | W/G 12 |
| | | G10 | | | | 5 | W/G 13 |
| | | E10 | | | | 6 | W/G 14 |
| | | C10 | | | | 7 | W/G 15 |
| | | A10 | | | | 8 | W/G 16 |
| H5 | | | | | B6 | PR | Pre1 |
| E6 | | | | | D6 | PR | Pre2 |
| C6 | | | | | F6 | PR | Pre3 |
| A6 | | | | | H6 | PR | Pre4 |
| H5 | | | | | A7 | PR | Pre5 |
| E6 | | | | | C7 | PR | Pre6 |
| C6 | | | | | E7 | PR | Pre7 |
| A6 | | | | | G7 | PR | Pre8 |
| | H5 | | | | B8 | PR | Pre9 |
| | E6 | | | | D8 | PR | Pre10 |
| | C6 | | | | F8 | PR | Pre11 |
| | A6 | | | | H8 | PR | Pre12 |
| | | H5 | | | A9 | PR | Pre13 |
| | | E6 | | | C9 | PR | Pre14 |
| | | C6 | | | E9 | PR | Pre15 |
| | | A6 | | | G9 | PR | Pre16 |
| G2 | | | | | A1 | Rec | Amp1 |
| D3 | | | | | C1 | Rec | Amp2 |
| C2 | | | | | E1 | Rec | Amp3 |
| | G2 | | | | G1 | Rec | Amp4 |
| | D3 | | | | B2 | Rec | Amp5 |
| | C2 | | | | D2 | Rec | Amp6 |
| | A2 | | | | F2 | Rec | Amp7 |
| | | G2 | | | H2 | Rec | Amp8 |
| | | D3 | | | A3 | Rec | Amp9 |
| | | C2 | | | C3 | Rec | Amp10 |
| | | A2 | | | E3 | Rec | Amp11 |
| | | | G2 | | G3 | Rec | Amp12 |
| | | | D3 | | B4 | Rec | Amp13 |
| | | | C2 | | D4 | Rec | Amp14 |
| | | | A2 | | F4 | Rec | Amp15 |
| | | | | | H4 | Rec | Amp16 |
| G8 | G8 | G8 | G8 | (2-4-76) | H2 | | -48v |
| H11 | H11 | H11 | H11 | 34 | E25 | | Pre16 |
| S12 | S12 | G12 | G12 | | G25 | | 30 IPS |
| F1 | F1 | F1 | F1 | 10-25 | A5,15 | | Ground |
| F3 | F3 | F3 | F3 | | C5,15 | | " |
| F5 | F5 | F5 | F5 | | E5,15 | | " |
| F7 | F7 | F7 | F7 | | G5,15 | | " |
| F9 | F9 | F9 | F9 | | B10 | | " |
| F11 | F11 | F11 | F11 | | D10 | | " |
| F12 | F12 | F12 | F12 | | F10 | | " |
| | | | | | H10 | | " |
| 2N052 | 2N052 | 2N052 | 2N052 | 57- | 1N104 | | Conn. |
| | | | | 40500 | 40500 | | |

SJ8 Input-Output

SJ9 Line Amp #1

(chnl 1-4)

SJ10 Line Amp #2

(chnl 5-8)

SJ11 Line Amp #3

(chnl 9-12)

SJ12 Line Amp #4

(chnl 13-16)

SJ13 Machine In-Out

Channels 1-8

SJ14 Machine In-Out

Channels 9-16

* See additional
sheet for
completed
wiring of SJ8.

On SJ8:

F26 jumper to A25 (red, B)

H26 jumper to C25 (blk, B)

1/2" long

BIT 16 TAPE SYSTEM SELF SYNC PAGE 1

| SJ10 | SJ11 | SJ12 | SJ13 | SJ14 | SJ18 | SWITCH | CKT |
|------|------|------|------|------|------|--------|-------|
| | | | | | B 16 | | SS 1 |
| | | | | | D 16 | | SS 2 |
| | | | | | E 16 | | SS 3 |
| | | | | | H 16 | | SS 4 |
| | | | | | A 17 | | SS 5 |
| | | | | | C 17 | | SS 6 |
| | | | | | E 17 | | SS 7 |
| | | | | | G 17 | | SS 8 |
| | | | | | B 18 | | SS 9 |
| | | | | | D 18 | | SS 10 |
| | | | | | F 18 | | SS 11 |
| | | | | | H 18 | | SS 12 |
| | | | | | A 19 | | SS 13 |
| | | | | | C 19 | | SS 14 |
| | | | | | E 19 | | SS 15 |
| | | | | | G 19 | | SS 16 |
| | | | | | B 20 | | RR 1 |
| | | | | | D 20 | | RR 2 |
| | | | | | F 20 | | RR 3 |
| | | | | | H 20 | | RR 4 |
| | | | | | A 21 | | RR 5 |
| | | | | | C 21 | | RR 6 |
| | | | | | E 21 | | RR 7 |
| | | | | | G 21 | | RR 8 |
| | | | | | B 22 | | RR 9 |
| | | | | | D 22 | | RR 10 |
| | | | | | F 22 | | RR 11 |
| | | | | | H 22 | | RR 12 |
| | | | | | A 23 | | RR 13 |
| | | | | | C 23 | | RR 14 |
| | | | | | E 23 | | RR 15 |
| | | | | | G 23 | | RR 16 |
| | | | 26 | | | | 1 |
| | | | 27 | | | | 2 |
| | | | 28 | | | | 3 |
| | | | 29 | | | | 4 |
| | | | 30 | | | | 5 |
| | | | 31 | | | | 6 |
| | | | 32 | | | | 7 |
| | | | 33 | | | | 8 |
| | | | 34 | | | | 9 |
| | | | 35 | | | | 10 |
| | | | 36 | | | | 11 |
| | | | 37 | | | | 12 |
| | | | 38 | | | | 13 |
| | | | 39 | | | | 14 |
| | | | 40 | | | | 15 |
| | | | 41 | | | | 16 |
| | | | 42 | | | | 17 |
| | | | 43 | | | | 18 |
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| | | | 45 | | | | 20 |
| | | | 46 | | | | 21 |
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| | | | 48 | | | | 23 |
| | | | 49 | | | | 24 |
| | | | 50 | | | | 25 |
| | | | 51 | | | | 26 |
| | | | 52 | | | | 27 |
| | | | 53 | | | | 28 |
| | | | 54 | | | | 29 |
| | | | 55 | | | | 30 |
| | | | 56 | | | | 31 |
| | | | 57 | | | | 32 |
| | | | 58 | | | | 33 |
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| | | | 62 | | | | 37 |
| | | | 63 | | | | 38 |
| | | | 64 | | | | 39 |
| | | | 65 | | | | 40 |
| | | | 66 | | | | 41 |
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| | | | 68 | | | | 43 |
| | | | 69 | | | | 44 |
| | | | 70 | | | | 45 |
| | | | 71 | | | | 46 |
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| | | | 83 | | | | 58 |
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| | | | 86 | | | | 61 |
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| | | | 90 | | | | 65 |
| | | | 91 | | | | 66 |
| | | | 92 | | | | 67 |
| | | | 93 | | | | 68 |
| | | | 94 | | | | 69 |
| | | | 95 | | | | 70 |
| | | | 96 | | | | 71 |
| | | | 97 | | | | 72 |
| | | | 98 | | | | 73 |
| | | | 99 | | | | 74 |
| | | | 100 | | | | 75 |

COLOR CODE

STRIPPED

(DOLBY) COLOR CODE

SYNC BUSS

(3-4-76) 34

F24 W/mid REG. BUSS

B 26 W/BLK

B 24 W/RED

D 24 W/GREEN

F 24 W/PURPLE

811D-16

811C-16 Tape System

Sel-Sync Panel 1 of 3

| | SJ11 | SJ12 | SJ13 | SJ14 | Switch | CKT. |
|----|------|------|------|------|--------------------------|---------|
| 0 | | | 35 | | ↑ Sel-Sync Switches 1-16 | E In1 |
| | | | 36 | | | E In2 |
| | | | 37 | | | E In3 |
| | | | 38 | | | E In4 |
| 1 | | | 39 | | | E In5 |
| 2 | | | 40 | | | E In6 |
| 1 | | | 41 | | | E In7 |
| 1 | | | 42 | | | E In8 |
| | H1 | | | 35 | | E In9 |
| | E2 | | | 36 | | E In10 |
| | D1 | | | 37 | | E In11 |
| | B1 | | | 38 | | E In12 |
| | | H1 | | 39 | | E In13 |
| | | E2 | | 40 | | E In14 |
| | | D1 | | 41 | | E In15 |
| | | B1 | | 42 | | E In16 |
| | | | 43 | | * Sel-Sync Switches 1-16 | E Out1 |
| | | | 44 | | | E Out2 |
| | | | 45 | | | E Out3 |
| | | | 46 | | | E Out4 |
| 13 | | | 47 | | | E Out5 |
| 13 | | | 48 | | | E Out6 |
| 13 | | | 49 | | | E Out7 |
| 13 | | | 50 | | | E Out8 |
| | H13 | | | 43 | | E Out9 |
| | F13 | | | 44 | | E Out10 |
| | D13 | | | 45 | | E Out11 |
| | B13 | | | 46 | | E Out12 |
| | | H13 | | 47 | | E Out13 |
| | | F13 | | 48 | | E Out14 |
| | | D13 | | 49 | | E Out15 |
| | | B13 | | 50 | | E Out16 |
| | | | | | * Sel-Sync Switches 1-16 | W/B 1 |
| | | | | | | W/B 2 |
| | | | | | | W/B 3 |
| | | | | | | W/B 4 |
| | | | | | | W/B 5 |
| | | | | | | W/B 6 |
| | | | | | | W/B 7 |
| | | | | | | W/B 8 |
| | H7 | | | | | W/B 9 |
| | E8 | | | | | W/B 10 |
| | D7 | | | | | W/B 11 |
| | B5 | | | | | W/B 12 |
| | | H7 | | | | W/B 13 |
| | | E8 | | | | W/B 14 |
| | | D7 | | | | W/B 15 |
| | | B5 | | | | W/B 16 |
| | | | | | * Sel-Sync Switches 1-8 | W/G 1 |
| | | | | | | W/G 2 |
| | | | | | | W/G 3 |
| | | | | | | W/G 4 |
| | | | | | | W/G 5 |
| | | | | | | W/G 6 |
| | | | | | | W/G 7 |
| | | | | | | W/G 8 |

SJ9 Line Amp #1
(chnl 1-4)SJ10 Line Amp #2
(chnl 5-8)SJ11 Line Amp #3
(chnl 9-12)SJ12 Line Amp #4
(chnl 13-16)SJ13 Machine In-Out
Channels 1-8SJ14 Machine In-Out
Channels 9-16

← 150Ω OUTS

← solder
steams
close to
connector

1-78 APPLY

811D-16

811D-16

811C-16 Tape System

Sei-Sync Panel

| SJ9 | SJ10 | SJ11 | SJ12 | SJ13 | SJ14 | Switch | CKT. |
|-----|------|------|------|------|------|----------|---------|
| H1 | | | | 35 | | ↑ | E In1 |
| E2 | | | | 36 | | Sei-Sync | E In2 |
| D1 | | | | 37 | | Switches | E In3 |
| B1 | | | | 38 | | 1-16 | E In4 |
| H1 | | | | 39 | | ↓ | E In5 |
| E2 | | | | 40 | | Sei-Sync | E In6 |
| D1 | | | | 41 | | Switches | E In7 |
| B1 | | | | 42 | | 1-16 | E In8 |
| | | H1 | | 35 | | ↑ | E In9 |
| | | E2 | | 36 | | Sei-Sync | E In10 |
| | | D1 | | 37 | | Switches | E In11 |
| | | B1 | | 38 | | 1-16 | E In12 |
| | | H1 | | 39 | | ↓ | E In13 |
| | | E2 | | 40 | | Sei-Sync | E In14 |
| | | D1 | | 41 | | Switches | E In15 |
| | | B1 | | 42 | | 1-16 | E In16 |
| H13 | | | | 43 | | ↑ | E Out1 |
| E13 | | | | 44 | | Sei-Sync | E Out2 |
| D13 | | | | 45 | | Switches | E Out3 |
| B13 | | | | 46 | | 1-16 | E Out4 |
| H13 | | | | 47 | | ↓ | E Out5 |
| E13 | | | | 48 | | Sei-Sync | E Out6 |
| D13 | | | | 49 | | Switches | E Out7 |
| B13 | | | | 50 | | 1-16 | E Out8 |
| | | H13 | | 43 | | ↑ | E Out9 |
| | | E13 | | 44 | | Sei-Sync | E Out10 |
| | | D13 | | 45 | | Switches | E Out11 |
| | | B13 | | 46 | | 1-16 | E Out12 |
| | | H13 | | 47 | | ↓ | E Out13 |
| | | E13 | | 48 | | Sei-Sync | E Out14 |
| | | D13 | | 49 | | Switches | E Out15 |
| | | B13 | | 50 | | 1-16 | E Out16 |
| H7 | | | | | | ↑ | W/B 1 |
| E8 | | | | | | Sei-Sync | W/B 2 |
| D7 | | | | | | Switches | W/B 3 |
| B5 | | | | | | 1-16 | W/B 4 |
| H7 | | | | | | ↓ | W/B 5 |
| E8 | | | | | | Sei-Sync | W/B 6 |
| D7 | | | | | | Switches | W/B 7 |
| B5 | | | | | | 1-16 | W/B 8 |
| | | H7 | | | | ↑ | W/B 9 |
| | | E8 | | | | Sei-Sync | W/B 10 |
| | | D7 | | | | Switches | W/B 11 |
| | | B5 | | | | 1-16 | W/B 12 |
| | | H7 | | | | ↓ | W/B 13 |
| | | E8 | | | | Sei-Sync | W/B 14 |
| | | D7 | | | | Switches | W/B 15 |
| | | B5 | | | | 1-16 | W/B 16 |
| G10 | | | | | | ↑ | W/G 1 |
| E10 | | | | | | Sei-Sync | W/G 2 |
| D10 | | | | | | Switches | W/G 3 |
| A10 | | | | | | 1-16 | W/G 4 |
| G10 | | | | | | ↓ | W/G 5 |
| E10 | | | | | | Sei-Sync | W/G 6 |
| D10 | | | | | | Switches | W/G 7 |
| A10 | | | | | | 1-16 | W/G 8 |

SJ9 Line Amp #1
(chnl 1-10)
SJ10 Line Amp #2
(chnl 5-8)
SJ11 Line Amp #3
(chnl 9-12)
SJ12 Line Amp #4
(chnl 13-16)
SJ13 Machine In-
Channels 1-
SJ14 Machine In-
Channels 9-

← 1502 00

add
ste
cl
Cassette

1-7 8 AMPLY
811D-16

BIB-16 TAPE SYSTEM SELF-SERVICE

| SJ1 | SJ10 | SJ11 | SJ12 | SJ13 | SJ14 | SJR | SWITCH | CRT |
|-----|------|------|------|-------------|------|------|--------|---------|
| | | | | | | B 16 | | SS 1 |
| | | | | | | D 16 | | SS 2 |
| | | | | | | F 16 | | SS 3 |
| | | | | | | H 16 | | SS 4 |
| | | | | | | A 17 | | SS 5 |
| | | | | | | C 17 | | SS 6 |
| | | | | | | E 17 | | SS 7 |
| | | | | | | G 17 | | SS 8 |
| | | | | | | B 18 | | SS 9 |
| | | | | | | D 18 | | SS 10 |
| | | | | | | F 18 | | SS 11 |
| | | | | | | H 18 | | SS 12 |
| | | | | | | A 19 | | SS 13 |
| | | | | | | C 19 | | SS 14 |
| | | | | | | E 19 | | SS 15 |
| | | | | | | G 19 | | SS 16 |
| | | | | | | B 20 | | RR 1 |
| | | | | | | D 20 | | RR 2 |
| | | | | | | F 20 | | RR 3 |
| | | | | | | H 20 | | RR 4 |
| | | | | | | A 21 | | RR 5 |
| | | | | | | C 21 | | RR 6 |
| | | | | | | E 21 | | RR 7 |
| | | | | | | G 21 | | RR 8 |
| | | | | | | B 22 | | RR 9 |
| | | | | | | D 22 | | RR 10 |
| | | | | | | F 22 | | RR 11 |
| | | | | | | H 22 | | RR 12 |
| | | | | | | A 23 | | RR 13 |
| | | | | | | C 23 | | RR 14 |
| | | | | | | E 23 | | RR 15 |
| | | | | | | G 23 | | RR 16 |
| | | | | 26 | | | | 1 |
| | | | | 27 | | | | 2 |
| | | | | 28 | | | | 3 |
| | | | | 29 | | | | 4 |
| | | | | 30 | | | | 5 |
| | | | | 31 | | | | 6 |
| | | | | 32 | | | | 7 |
| | | | | 33 | | | | 8 |
| | | | | 26 | | | | 9 |
| | | | | 27 | | | | 10 |
| | | | | 28 | | | | 11 |
| | | | | 29 | | | | 12 |
| | | | | 30 | | | | 13 |
| | | | | 31 | | | | 14 |
| | | | | 32 | | | | 15 |
| | | | | 33 | | | | 16 |
| | | | | (2-4-76) 33 | | F204 | W/100 | REC. PR |
| | | | | | | B 26 | W/100 | |
| | | | | | | B 24 | W/100 | |
| | | | | | | D 24 | W/100 | |

COLOR CODE

COLOR CODE

STRIPED

(POLBY) COLOR CODE

811D STRACK PINOUTS

STEPHENS 811D-8 ELECTRONICS

Input-Output Connector

(Amphenol 57-40500 Chassis)
(Amphenol 57-30500 Cable)

| <u>Pin</u> | <u>Connection</u> |
|------------|---------------------------|
| 10-17 | Ground Record In |
| 18-25 | Ground Playback Out |
| 26-33 | Dolby Enable |
| 34 | Master Record |
| 35-42 | Record In Hot (35 = 1) |
| 43-50 | Playback Out Hot (43 = 1) |

STEPHENS 811D-8 ELECTRONICS

Input-Output Connector

(Amphenol 57-40500 Chassis)
(Amphenol 57-30500 Cable)

| <u>Pin</u> | <u>Connection</u> |
|------------|---------------------------|
| 10-17 | Ground Record In |
| 18-25 | Ground Playback Out |
| 26-33 | Dolby Enable |
| 34 | Master Record |
| 35-42 | Record In Hot (35 = 1) |
| 43-50 | Playback Out Hot (43 = 1) |

4-TRACK

| PIN NO. | CONNECTION | CONNECTOR N. J20 |
|---------|--------------------|---------------------|
| 1 | NOT USED | |
| 2 | " | |
| 3 | " | |
| 4 | " | |
| 5 | " | |
| 6 | " | |
| 7 | " | |
| 8 | " | |
| 9 | " | |
| 10 | Record Input, GND | 1 |
| 11 | " | 2 |
| 12 | " | 3 |
| 13 | " | 4 |
| 14 | NOT USED | |
| 15 | " | |
| 16 | " | |
| 17 | " | |
| 18 | Playback Out, GND | 1 |
| 19 | " | 2 |
| 20 | " | 3 |
| 21 | " | 4 |
| 22 | NOT USED | |
| 23 | " | |
| 24 | " | |
| 25 | " | |
| 26 | Dolby Control, 24V | 1 |
| 27 | " | 2 |
| 28 | " | 3 |
| 29 | " | 4 |
| 30 | NOT USED | |
| 31 | " | |
| 32 | " | |
| 33 | " | |
| 34 | Dolby Control, Com | |
| 35 | Record Input, High | 1 |
| 36 | " | 2 |
| 37 | " | 3 |
| 38 | " | 4 |
| 39 | NOT USED | |
| 40 | " | |
| 41 | " | |
| 42 | " | |
| 43 | Playback Out, High | 1 |
| 44 | " | 2 |
| 45 | " | 3 |
| 46 | " | 4 |
| 47 | NOT USED | |
| 48 | " | |
| 49 | " | |
| 50 | " | |

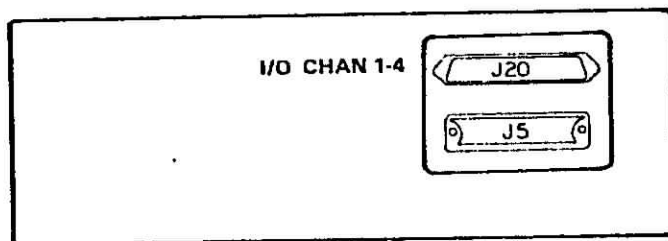


Figure 3-1. 4-Track Sync Panel, Rear Connectors

8-TRACK

| PIN NO. | CONNECTION | CONNECTOR NO. J20 |
|---------|--------------------|----------------------|
| 1 | NOT USED | |
| 2 | " | |
| 3 | " | |
| 4 | " | |
| 5 | " | |
| 6 | " | |
| 7 | " | |
| 8 | " | |
| 9 | " | |
| 10 | Record Input, GND | 1 |
| 11 | " | 2 |
| 12 | " | 4 |
| 13 | " | 5 |
| 14 | " | 6 |
| 15 | " | 7 |
| 16 | " | 8 |
| 17 | " | |
| 18 | Playback Out, GND | 1 |
| 19 | " | 2 |
| 20 | " | 3 |
| 21 | " | 4 |
| 22 | " | 5 |
| 23 | " | 6 |
| 24 | " | 7 |
| 25 | " | 8 |
| 26 | Dolby Control, 24V | 1 |
| 27 | " | 2 |
| 28 | " | 3 |
| 29 | " | 4 |
| 30 | " | 5 |
| 31 | " | 6 |
| 32 | " | 7 |
| 33 | " | 8 |
| 34 | Dolby Control, Com | |
| 35 | Record Input, High | 1 |
| 36 | " | 2 |
| 37 | " | 3 |
| 38 | " | 4 |
| 39 | " | 5 |
| 40 | " | 6 |
| 41 | " | 7 |
| 42 | " | 8 |
| 43 | Playback Out, High | 1 |
| 44 | " | 2 |
| 45 | " | 3 |
| 46 | " | 4 |
| 47 | " | 5 |
| 48 | " | 6 |
| 49 | " | 7 |
| 50 | " | 8 |

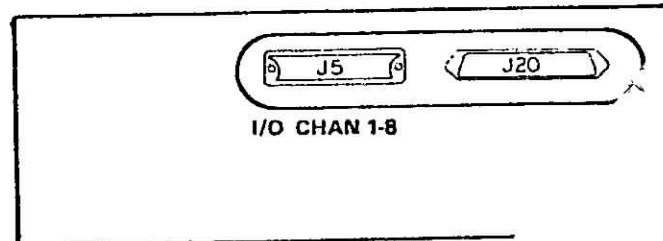
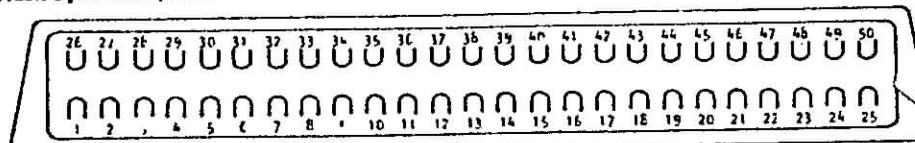
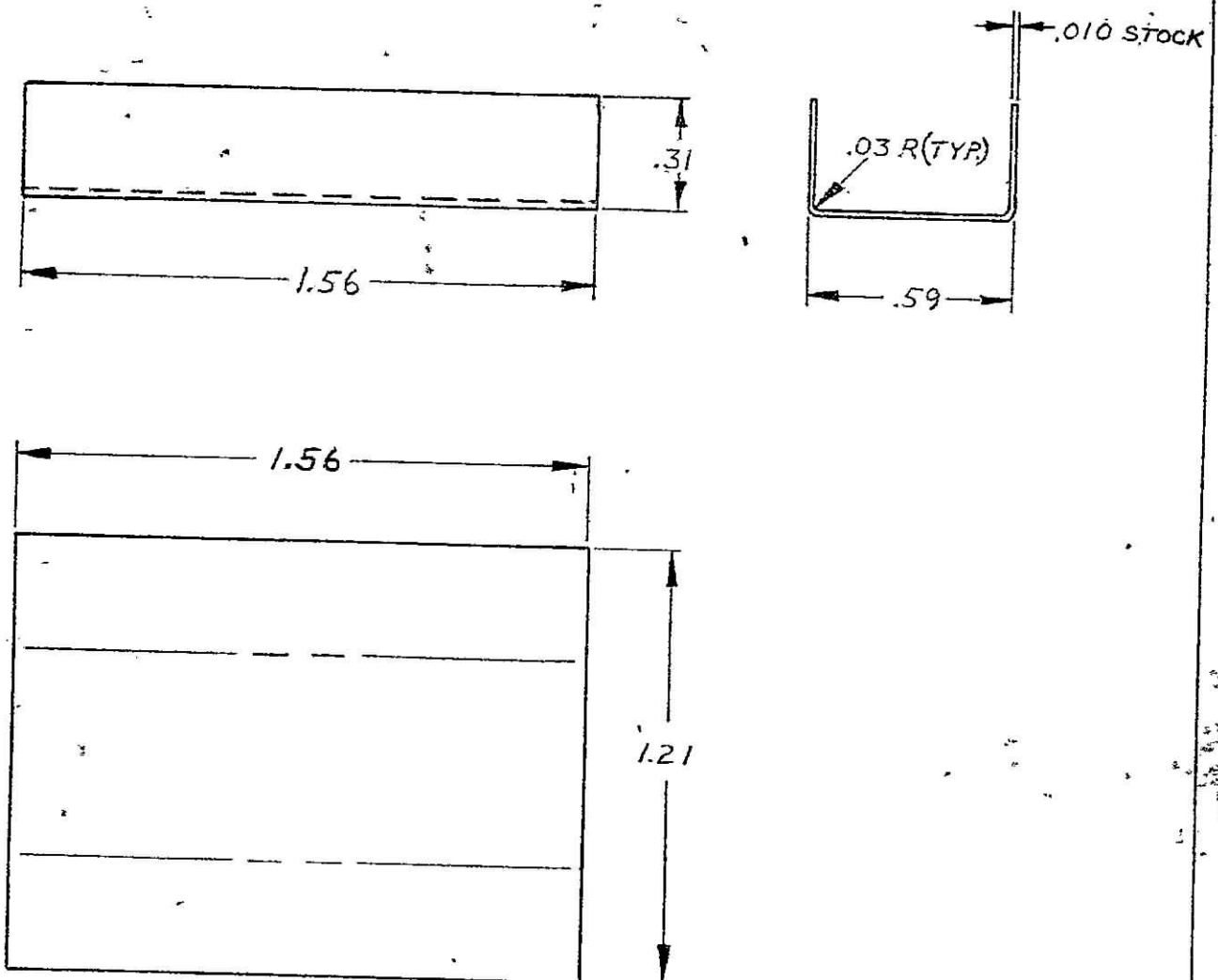


Figure 3-2. 8-Track Sync Panel, Rear



I/O CONNECTOR WIRING SIDE



FLAT PATTERN

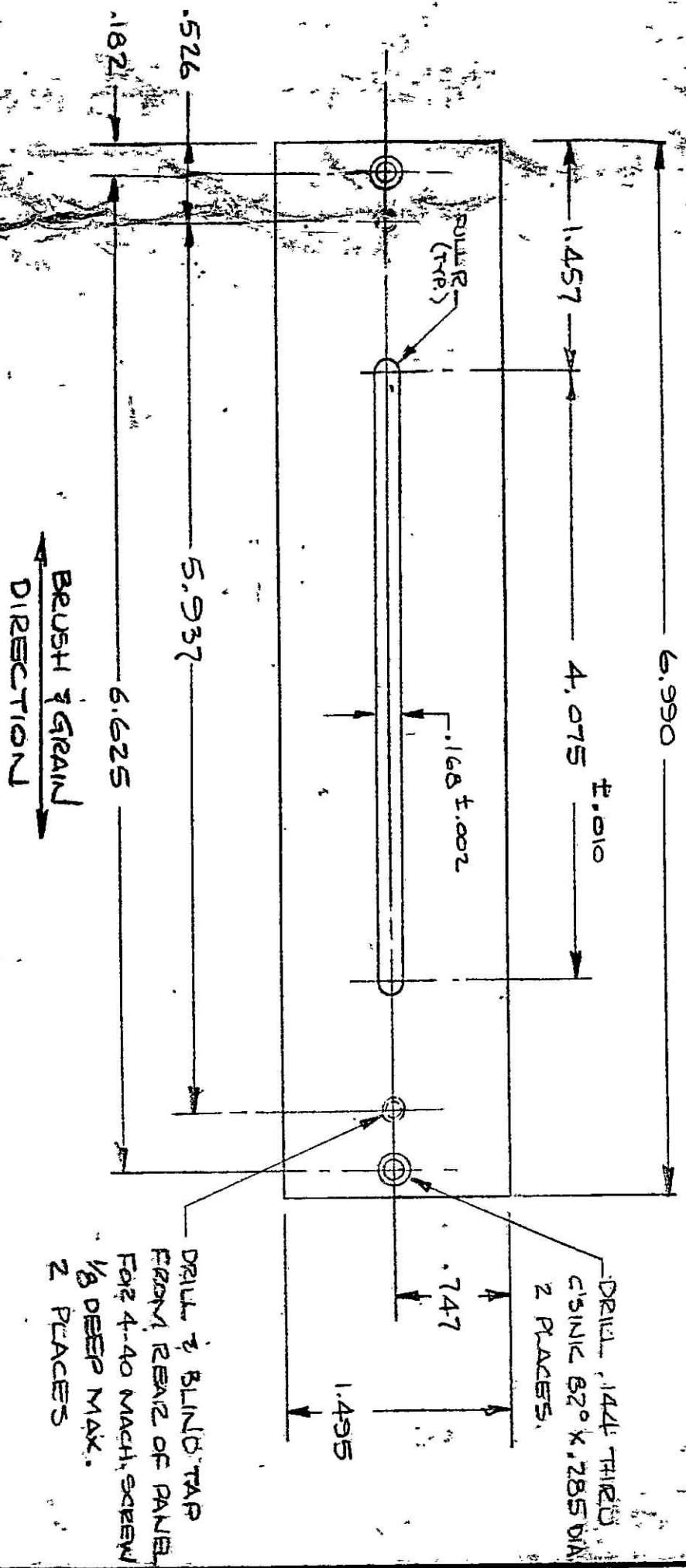
2. BREAK ALL SHARP EDGES

1. TIN PLATE PER MIL-T-10727A AFTER FORMING

NOTES:

| REVISIONS | | | STEPHENS ELECTRONICS BURBANK, CALIFORNIA | | |
|-----------|------|----|---|--|--|
| NO. | DATE | BY | SHIELD RELAY SOCKET | | |
| A | | | | | |
| B | | | | | |
| C | | | | | |
| D | | | | | |
| E | | | | | |

| | | |
|---------------------------|------------------|--------------------------|
| DESIGNED BY H. PIROUGH | SCALE 2X SIZE | MATERIAL 1020 STL. SH |
| CHECKED BY L. Leigh | DATE 8/22/73 | DRAWING NO. |
| TRACED | APP'D | 110909 |



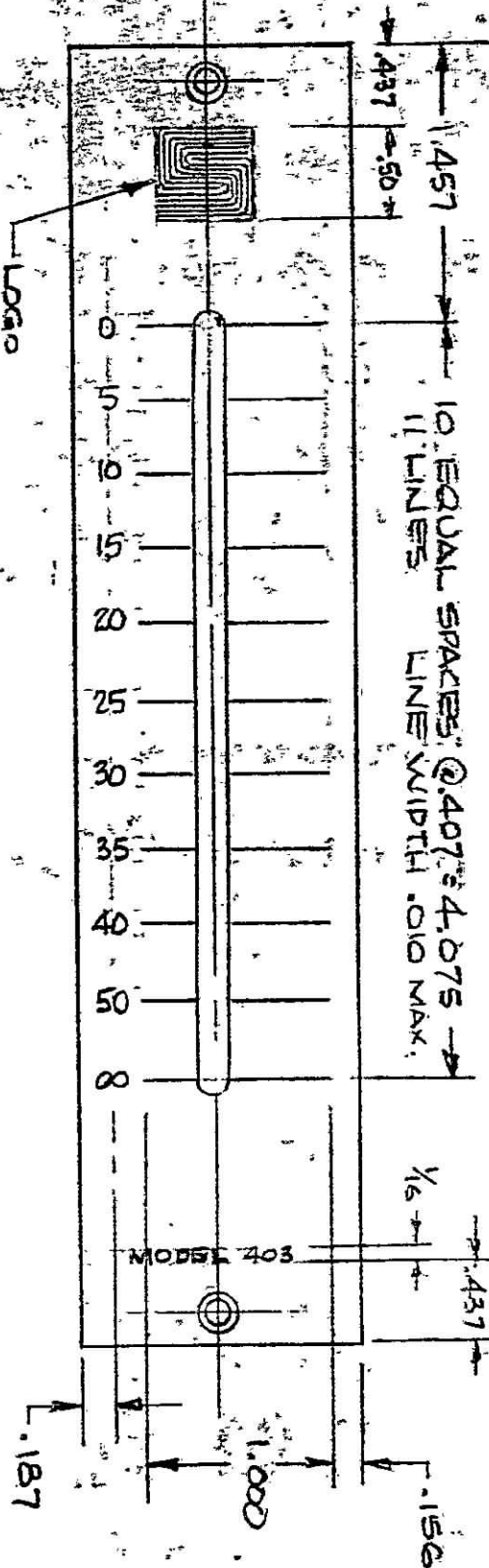
MATL: 1937 ALUM 6061-T6
FINISH: GRIND 32/ MICROFINISH BOTH SIDES

BLACK ANODIZE

KXX = ±.005

STEPHENS ELECTRONICS, INC.

| | | | |
|------------------------|--|--------------------|--|
| SCALE: FULL | | APPROVED BY: | |
| DATE: 12/21/70 | | DRAWN BY: G. G. G. | |
| PLATE - FACE | | REVISED | |
| (FABRICATION) | | | |
| ATTENUATOR - MODEL 403 | | DRAWING NUMBER | |
| | | 130021 | |



ENGRAVE AFTER ANODIZING
 SKIN CUT - NO FILL
 CHARACTERS 1/8 SEMI-CONDENSED
 GRAPHIC CENTERED & LOCATED
 AS SHOWN

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DATE: 12/22/70

DRAWN BY: G. G. G.
 REVISED:

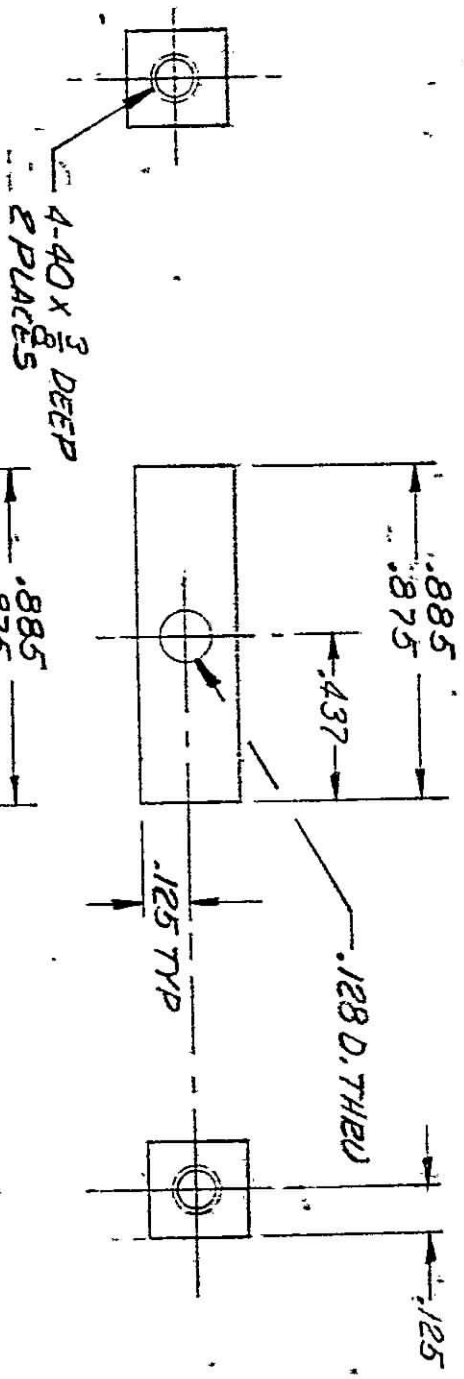
RATE - FACE

(ENGRAVING)

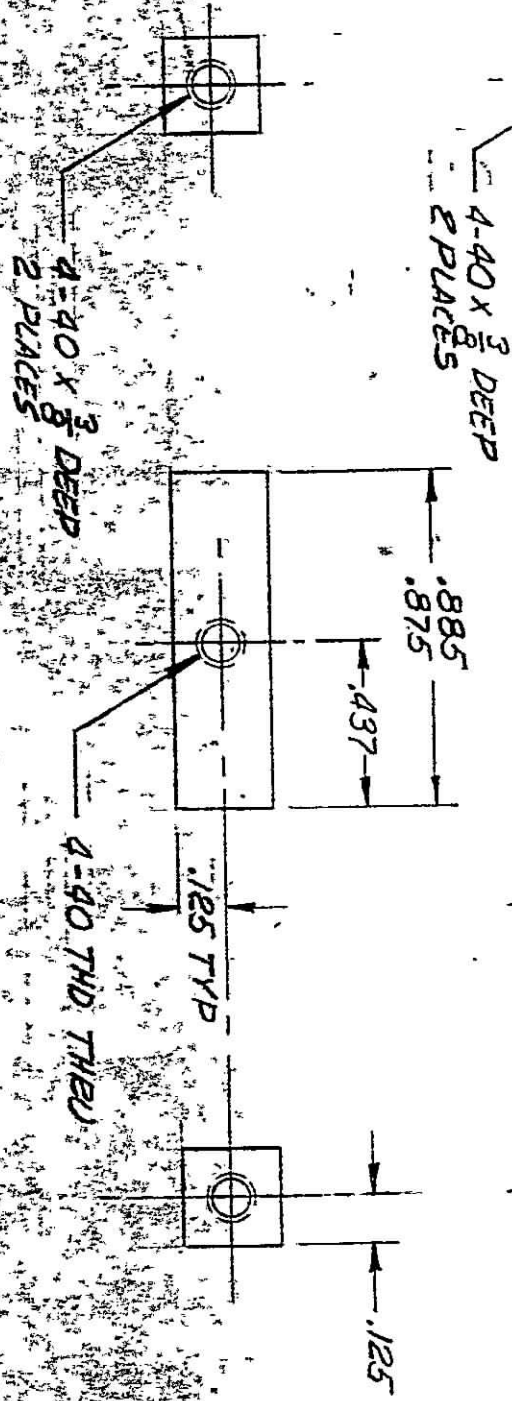
ATTENUATOR - MODEL 403

DRAWING NUMBER
 130022

TYPE "A"
2 REQ/UNIT



TYPE "B"
1 REQ/UNIT



MATERIAL: 1/4" 50 STOCK, 2024-T4 OR 2017-T4
FINISH: ANODINE #1200 OR 1E/DITE

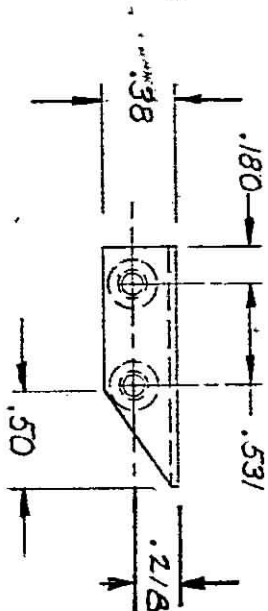
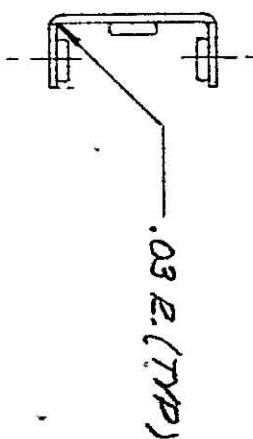
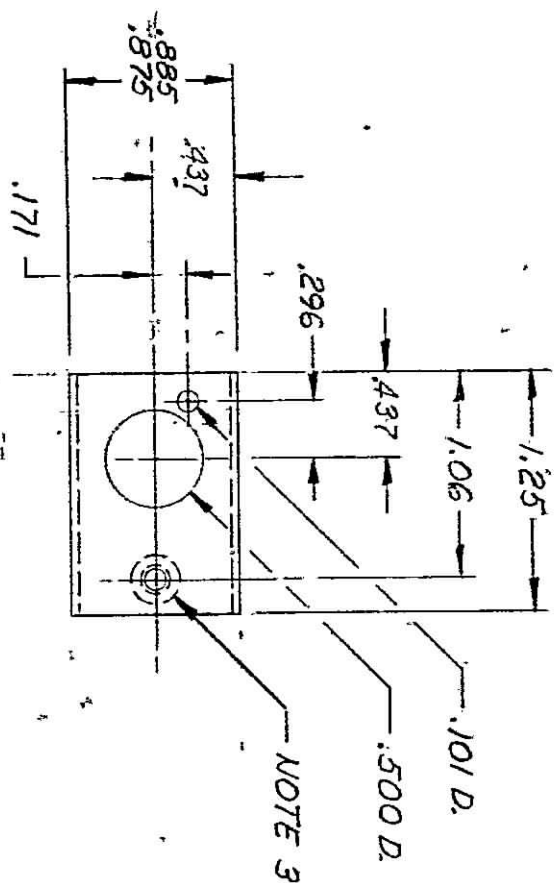
SPACER

XXX ±.005

STEPHENS ELECTRONICS
BUREAU, CALIF. 842-5116
DESIGN: D. DUNN 1-14-65
SCALE: 2:1

130025

XX = $\pm .020$
 .XXX = $\pm .010$



BRACKET, CONNECTOR
 FULL SCALE
 DESIGN: W. Dunsford 1-7-65

3. INSTALL 4-40 CLINCH-TYPE NUTS AS SHOWN (5 PLACES)
2. FINISH: CADMIUM PL.

1. MAT'L: .040 .C1010 STL.

NOTES:

STEPHENS ELECTRONICS

2302 N. ONTARIO ST.
 BURBANK, CALIF.

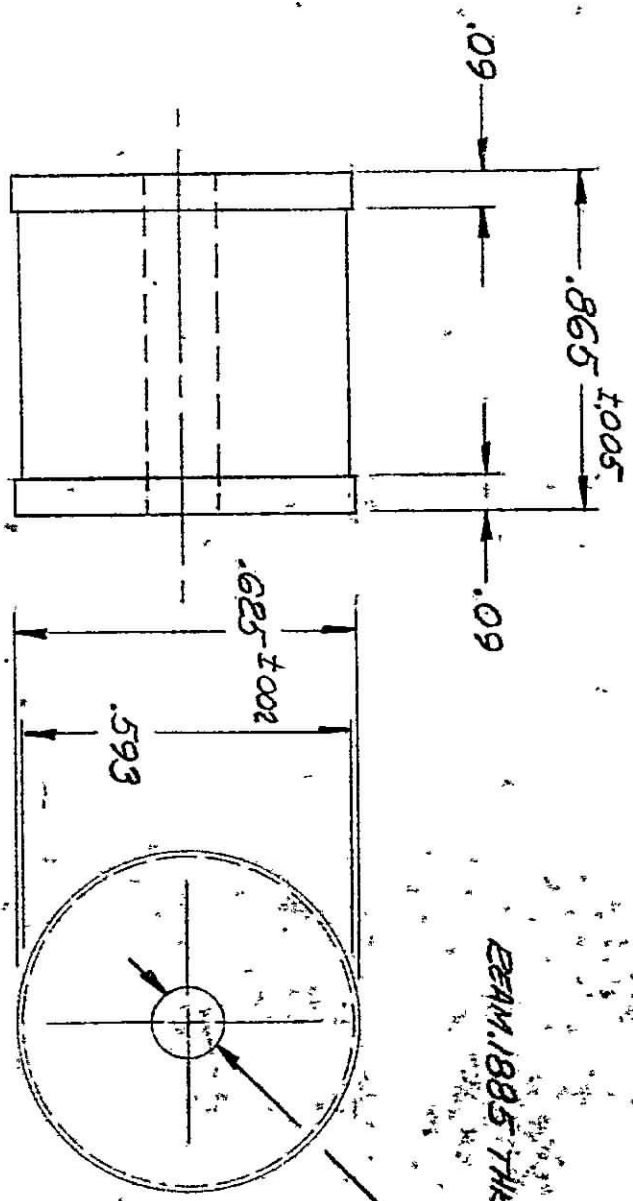
842.5116

130026

REVISIONS

A WAS 4 REQ/UNIT 9/23/70 SC

REAM .1885 THRU



NOTES:

1. MATL: NYLATEON EOD
2. BREAK SHARP EDGES

① 2 REQ/UNIT

XX = $\pm .02$

XX = $\pm .010$

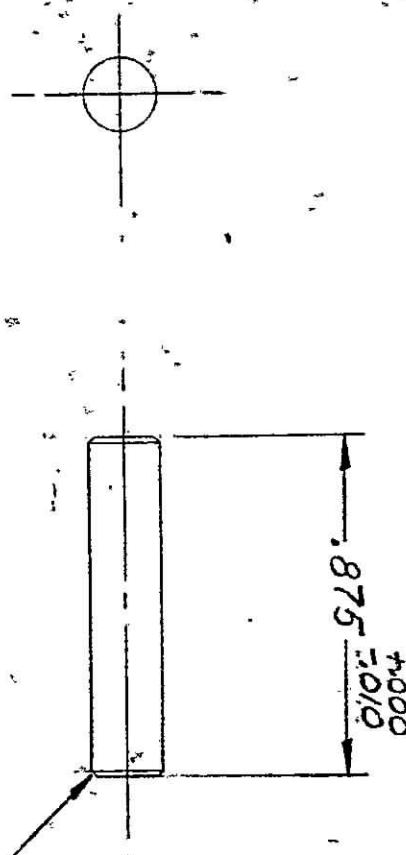
POLLER

REV A 9/23/70

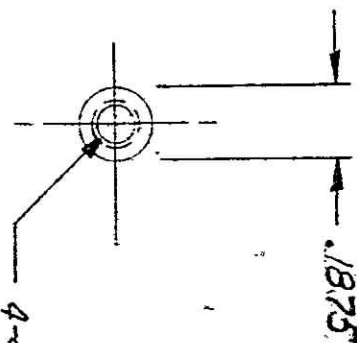
STEPHENS ELECTRONIC
BUEBAUC, CALIF. 842-5116

DESIGN: D. DUNNELL K-14-65
SCALE: 2:1

130027



CHAMFER BOTH ENDS
 $.010 \times 45^\circ$



MATL: CRES. 18-8 TYPE 303 CQUD. A
 (MAKE FROM DOWEL PIN.)

ROLLER SHAFT

STEPHENS ELECTRONICS
 BUEBAK, CALIF. 942-5116

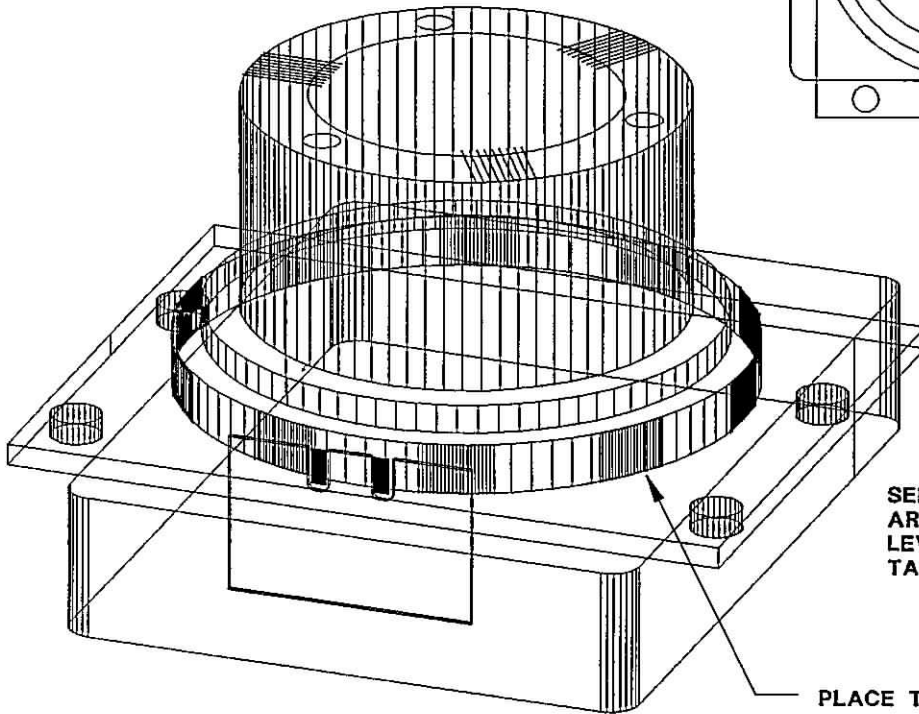
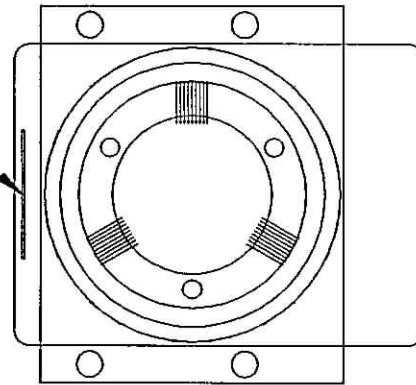
DESIGN: H. DUNDY 1-14-65
 SCALE: 2:1

4 REQ/UNIT

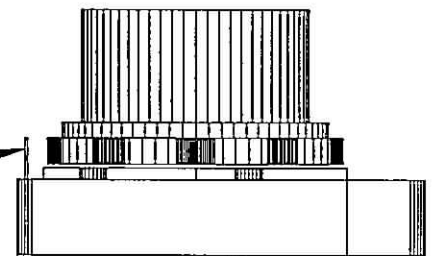
130028

LEFT REEL MOTOR

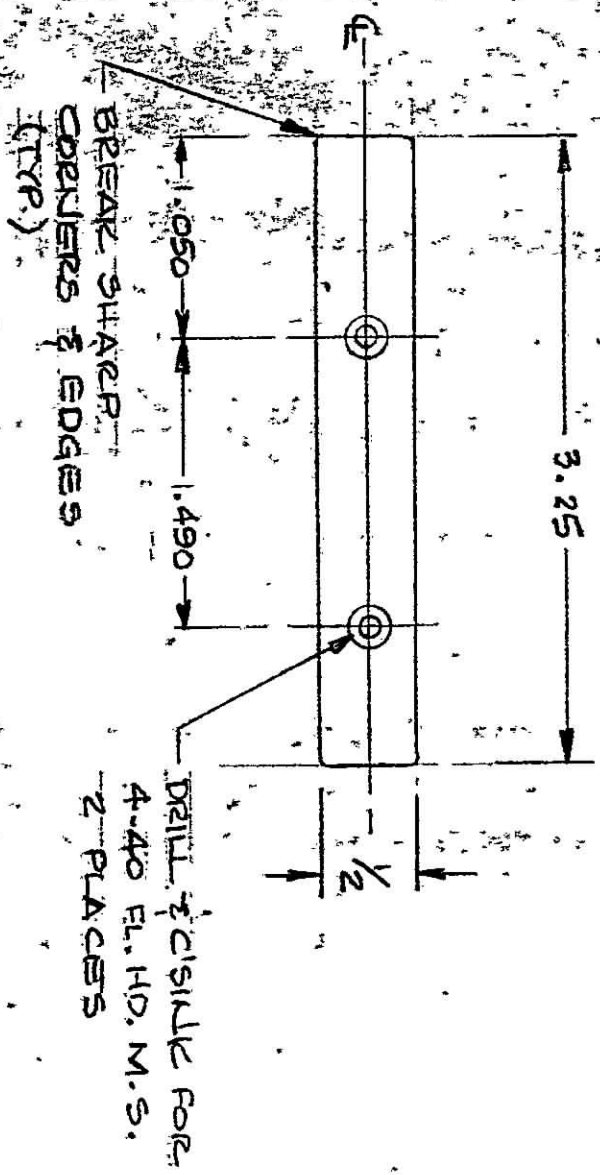
PLACE SENSOR ON SIDE OF DECK FRAME



SENSORS
ARE
LEVEL WITH
TABS



PLACE TABS AROUND HUB

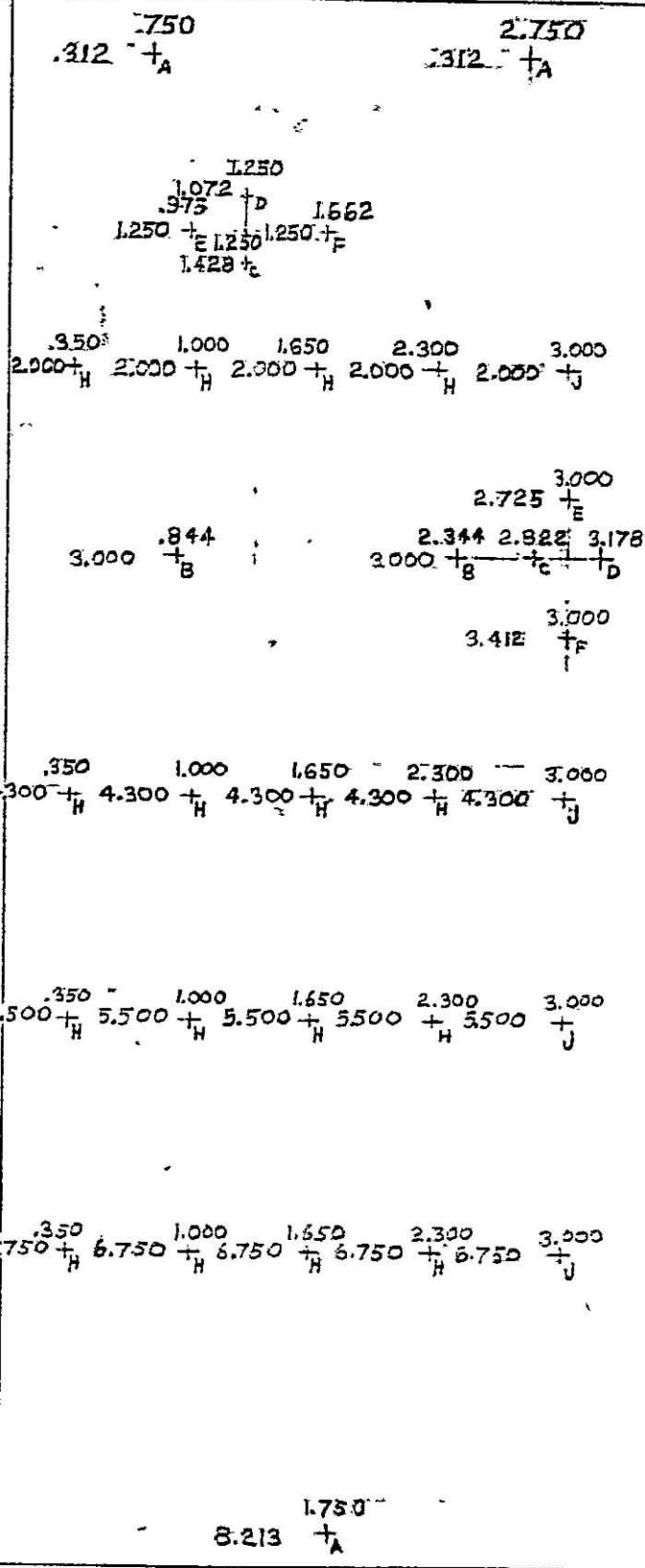
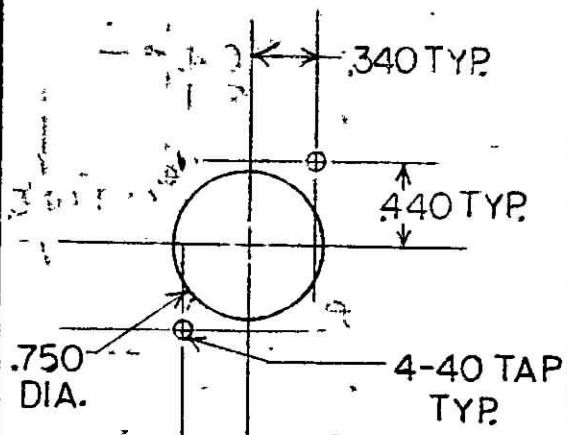


MAT'L: ALUM $\frac{1}{16}$ THICK
 FINISH: BLACK ANODIZE

STEPHENS ELECTRONICS, INC.

| | | |
|------------------------------|--------------|-----------------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: C. G. B. B. |
| DATE: 8/15/74 | | REVIEWED: |
| HANDLE - ELECTRONICS CHASSIS | | |
| MODEL 4400 | | |
| DRAWING NUMBER 10958 | | |

- A- .156 DIA.
 B- .120 DIA.
 C- 4-40 TAP
 D- .125 DIA.
 E- .250X .656
 F- .582 X .656
 H- .250 DIA.
 J- SEE DETAIL



STEPHENS ELECTRONICS

SCALE: FULL

DATE: 1-13-70

APPROVED BY:

DRAWN BY DMS

REVISED

811C-4100

CHASSIS

DRAWING NUMBER

110931

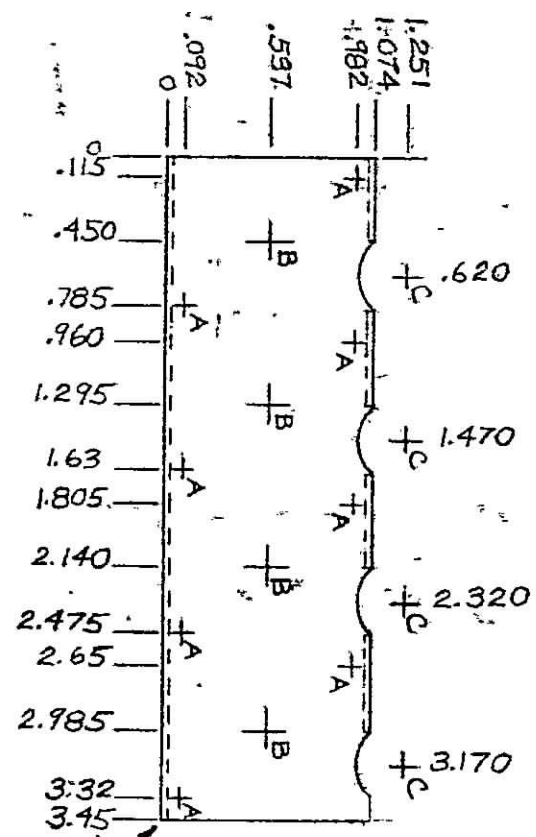
MAT'L 6061-T4 .090 THK.

XX±.005

XXX±.001

REMOVE ALL BURRS

A DRILL TAP FOR #4-40
B .750 DRILL
C .265 RADIUS



BEND 90°
TWO PLACES

MAT'L .032 TIN PLATE .XXX ± .005

STEPHENS ELECTRONICS, INC.

SCALE: FULL

DATE: 3-30-73

APPROVED BY:

DRAWN BY SRS

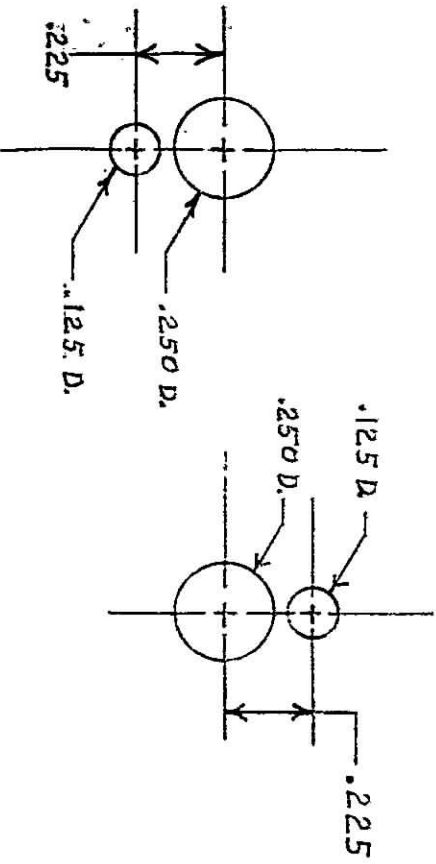
REVISED

PLATE - SOCKET HOLD DOWN

DRAWING NUMBER

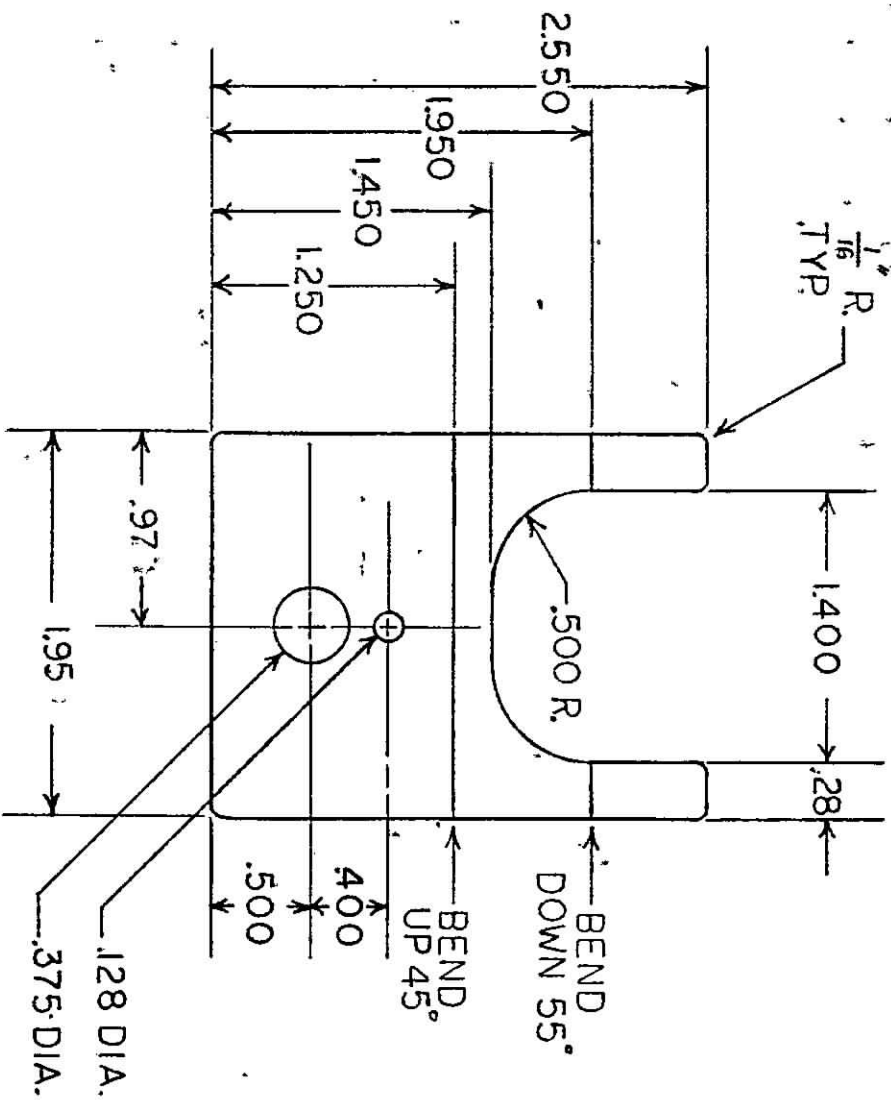
110964

DETAIL "B"



A - SEE DETAIL "A"
B - SEE DETAIL "B"
C - .375 D. .375
D - .250 D. .250
XXX .005

DRAWING NUMBER



.XXX±.005 .XX±0.5° MATL.065 THK. 6061-T6

STEPHENS ELECTRONICS

SCALE: FULL

APPROVED BY:

DATE: 11-4-69

DRAWN BY DMS

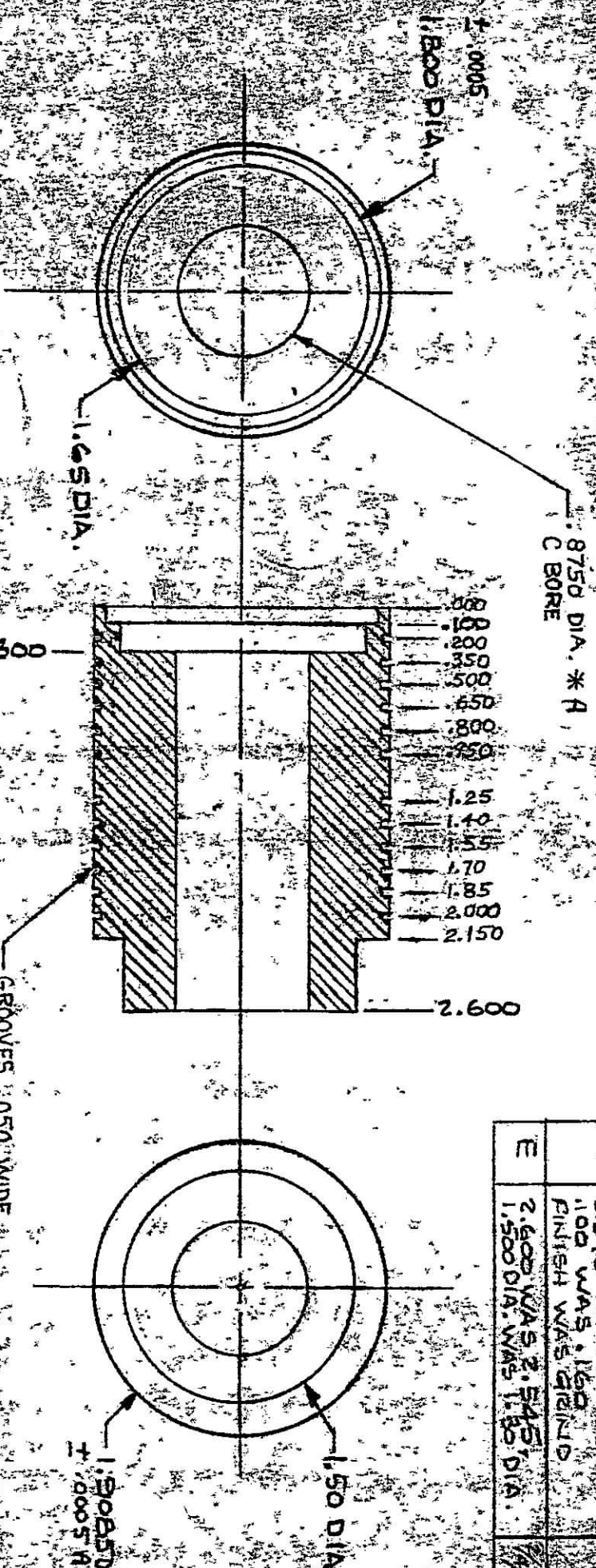
REVISED

VU METER RETAINING CLIP

DRAWING NUMBER

110505A

REMOVE ALL BURRS AND ROUGH EDGES



| REVISIONS | | |
|-----------|--|--------|
| SYM | DESCRIPTION | DATE |
| D | 1.65 DIA. WAS 1.500 DIA. 1.50 DIA. WAS 1.445 DIA. ADDED 1.800 DIA. * A 2.545 WAS 2.285 1.100 WAS 1.100 FINISH WAS GRIND | 7/1/71 |
| E | 2.600 WAS 2.545 1.500 DIA. WAS 1.50 DIA. | 7/1/71 |

1. CONCENTRICITY $\pm .0002$

MAX $\pm .010$

MAX $\pm .005$ DIA. $\pm .0005$

FINISH: GLASS BEAD BLAST

REMOVE ALL BURRS AND ROUGH EDGES

* HAND PRESS FIT TO SUPPLIED BEARING

OR BEARING DIA. 1.6750 $\pm .0002$

MAT'L: T-6061 ALUMINUM

STEPHENS ELECTRONICS, INC.

SCALE: FULL

DATE: 3-26-73

APPROVED BY:

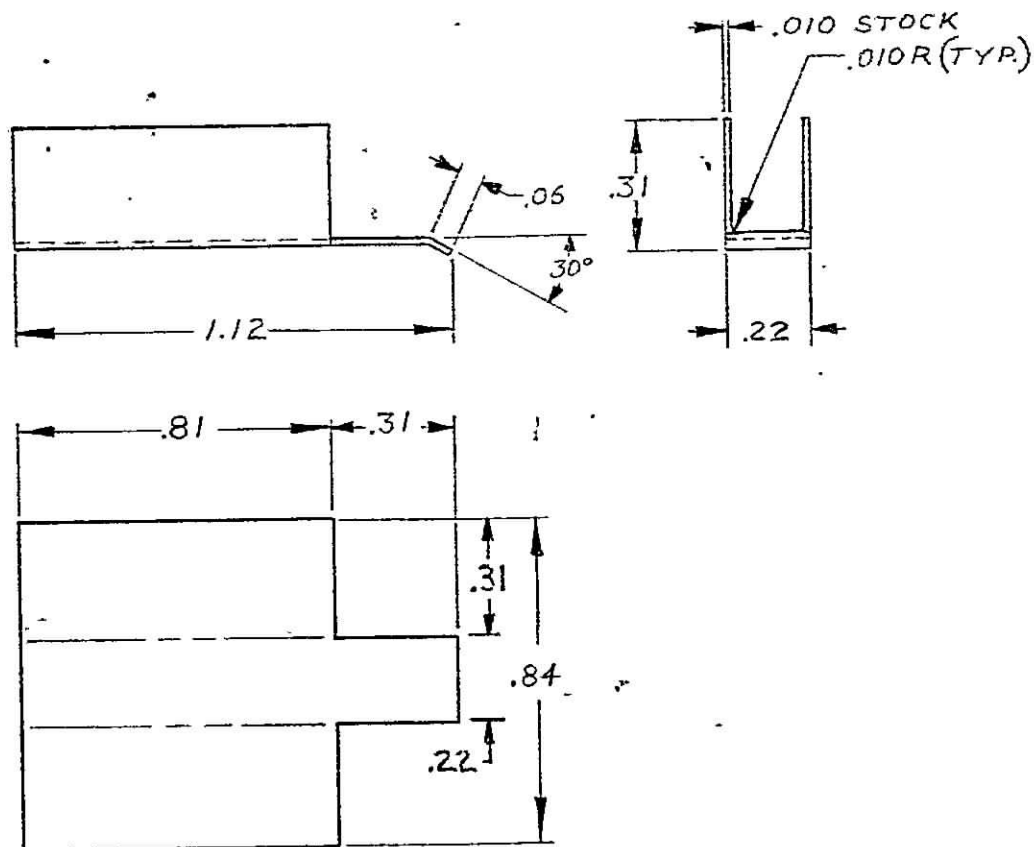
[Signature]

DRAWN BY: GRS

REVISED

REVERSE IDLER

DRAWING NUMBER
110134 E



FLAT PATTERN.

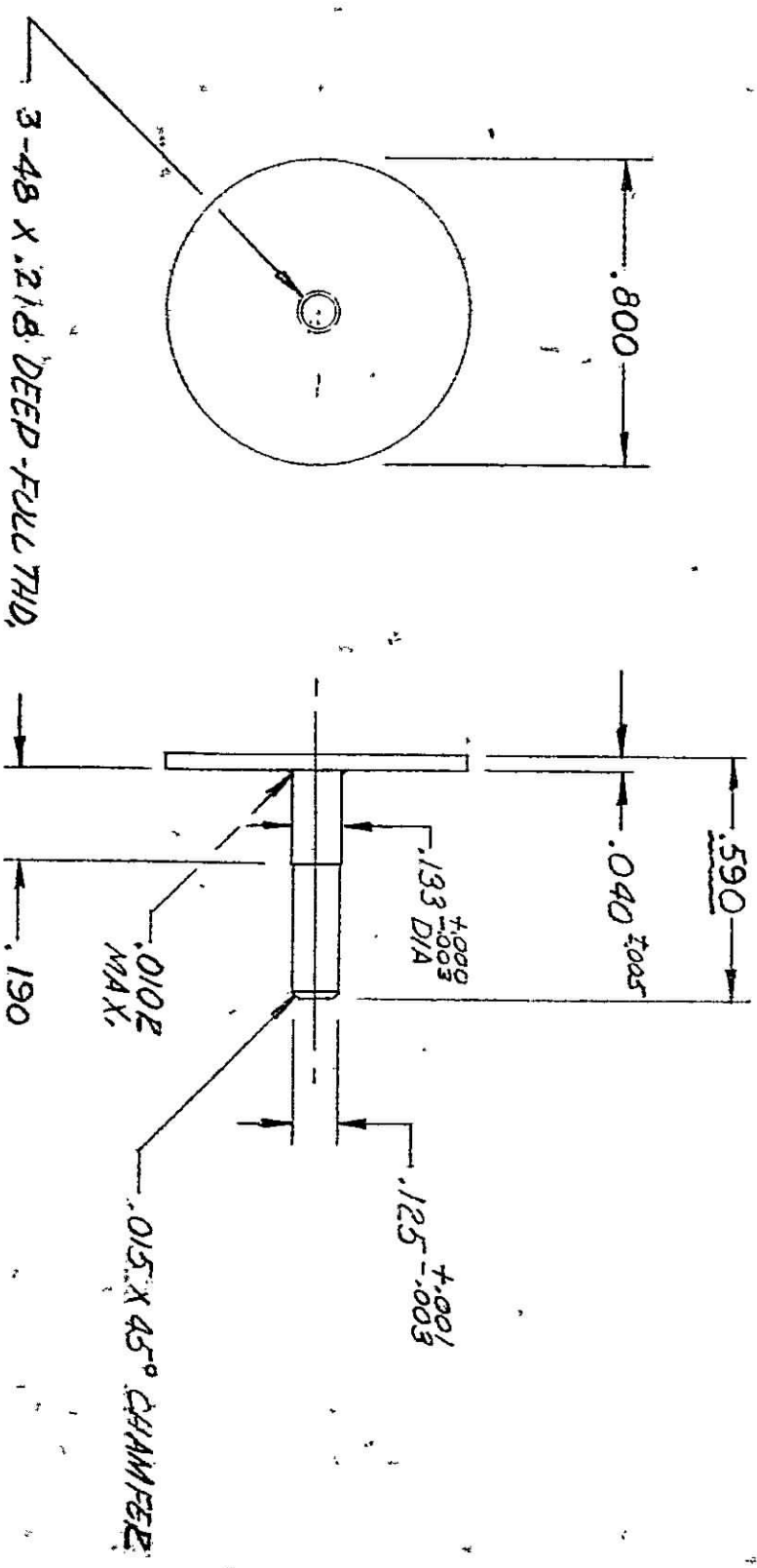
2. BREAK ALL SHARP EDGES

1. TIN PLATE PER MIL-T-10727A AFTER FORMING

NOTES:

| REVISIONS | | | STEPHENS ELECTRONICS BURBANK, CALIFORNIA | |
|-----------|------|----|---|---------------------------------|
| S. | DATE | BY | SHIELD WIRE | |
| A | | | | |
| B | | | | |
| C | | | <small>WM BY</small> H. PIROUGH | <small>SCALE</small> 2X SIZE |
| D | | | <small>CHK'D</small> L. Leigh | <small>DATE</small> 8/22/73 |
| E | | | <small>TRACED</small> | <small>APP'D</small> |
| | | | <small>MAT. RIAL</small> 1020 STL SH. | |
| | | | <small>DRAWING NO.</small> 110910 | |

REVISIONS
 A1
 .590 WAS .650
 .190 WAS .250
 3-48 WAS 4-40 THD.
 7/6/71 JG



2. FINISH

1. MATERIAL: BRASS

NOTES: UNLESS OTHERWISE SPECIFIED

1 EQ/UNIT

SHAFT

REV A 1/4/71

STEPHENS ELECTRONICS

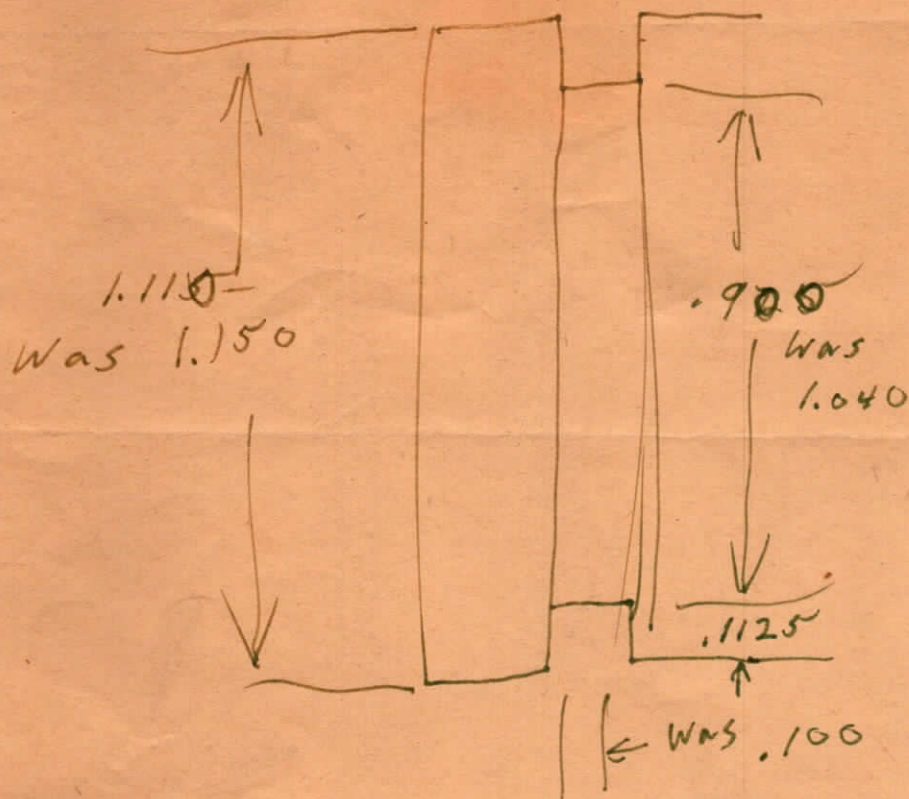
BUEBAK, CALIF. 842-5116

DESIGN: W. Russell 11-16-65

SCALE: 2:1

130032

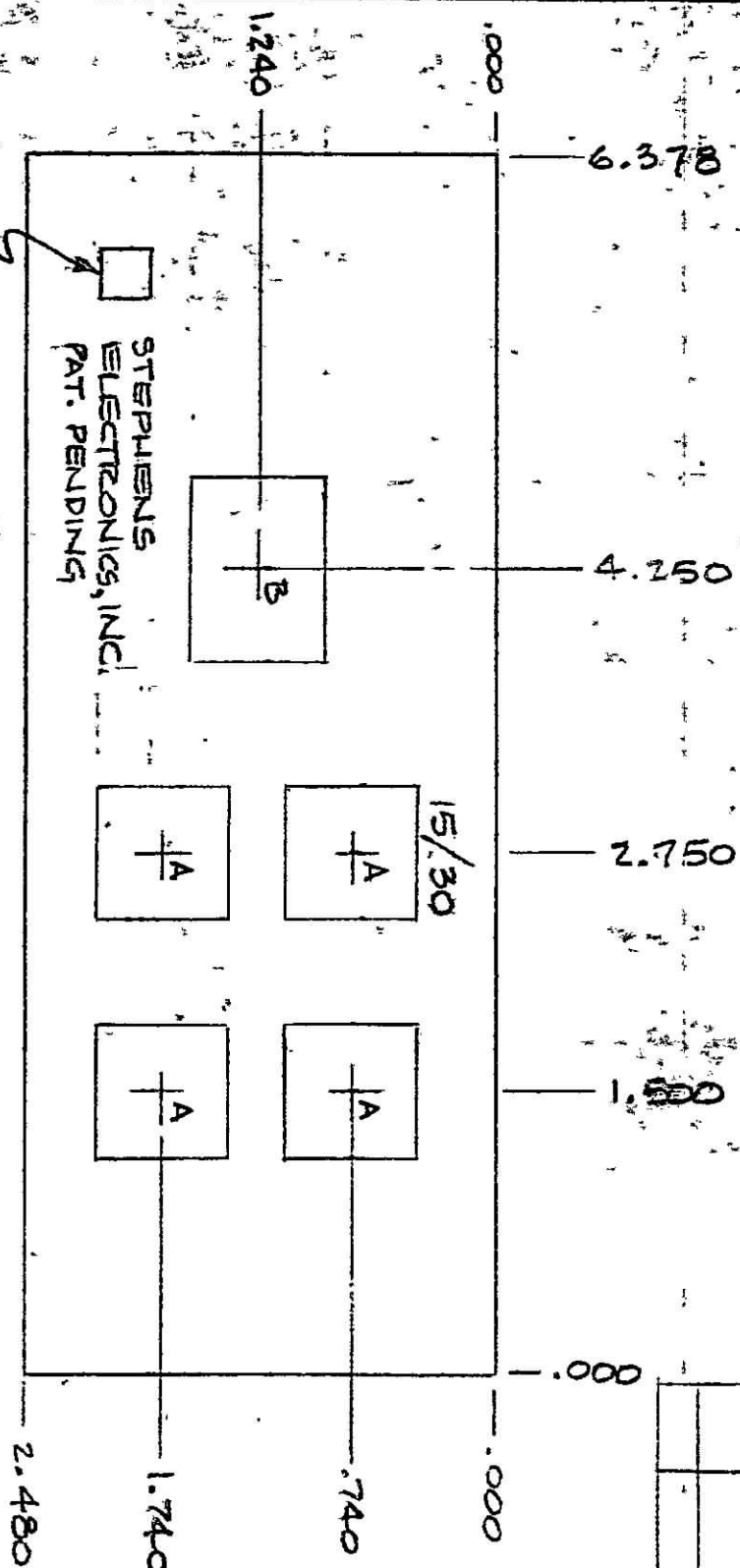
GUIDE CORE CHANGES
for 8THK
12-17-80



811-D GUIDES
CHANGES

$.110$

| REVISIONS | | |
|-----------|-------------|------|
| SYM | DESCRIPTION | DATE |
| | | |
| | | |



A = .720 X .720
B = .970 X .720

NOTE: HOLE PATTERN MUST
MATE WITH "B" HOLES IN
PART NO. A10107.

XXX = ±.005

MATL: .100 THK ALUM 6061-T6
FINISH: ANODIZED & PAINT FACES
ONLY PER FED. STD #26081 DARK GRAY
ENGRAVE 1/8" LETTERS CENTERED
& LOCATED AS SHOWN. FILL WHITE

STEPHENS ELECTRONICS, INC.

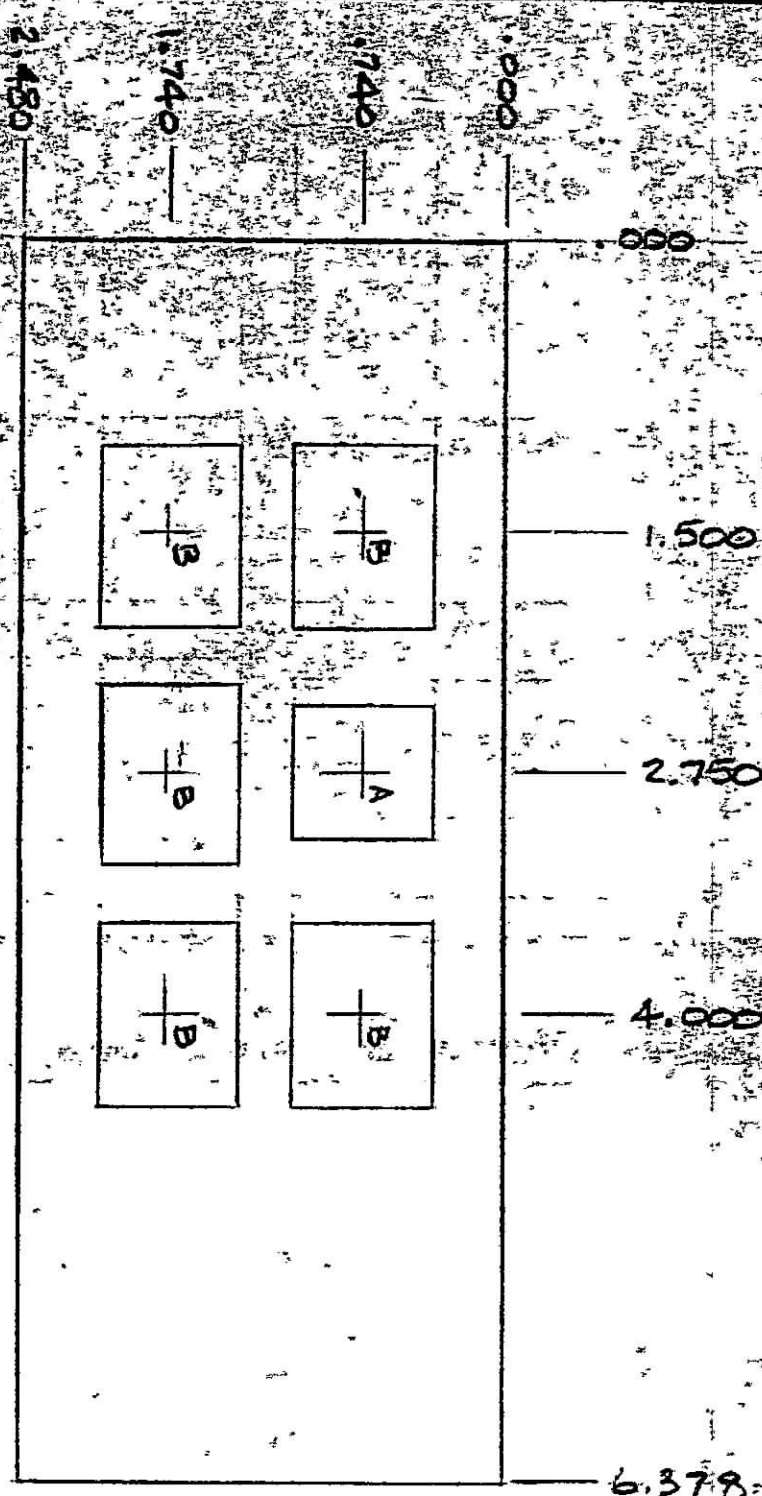
| | | |
|---------------|--------------|-----------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: GEIER |
| DATE: 6/14/71 | | REVISED |

DECK PANEL - LEFT UPPER

811D - 103

DRAWING NUMBER
110105

| REVISIONS | | DATE |
|-----------|-------------|------|
| SYM | DESCRIPTION | |



FINISH : ALUMINUM & PAINT FACES ONLY
 PER FED. STD. # 26081 DARK GRAY
 MAT'L : .100 THK ALUM 6061-T6

A = .720 X .720
 B = .970 X .720
 NOTE : HOLE PATTERN MUST
 MATCH WITH "B" HOLES
 IN PART NO. A10108.

STEPHENS ELECTRONICS, INC.

| | | |
|---------------|--------------|---------------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: G. J. PER |
| DATE: 6/14/71 | | REVISED |

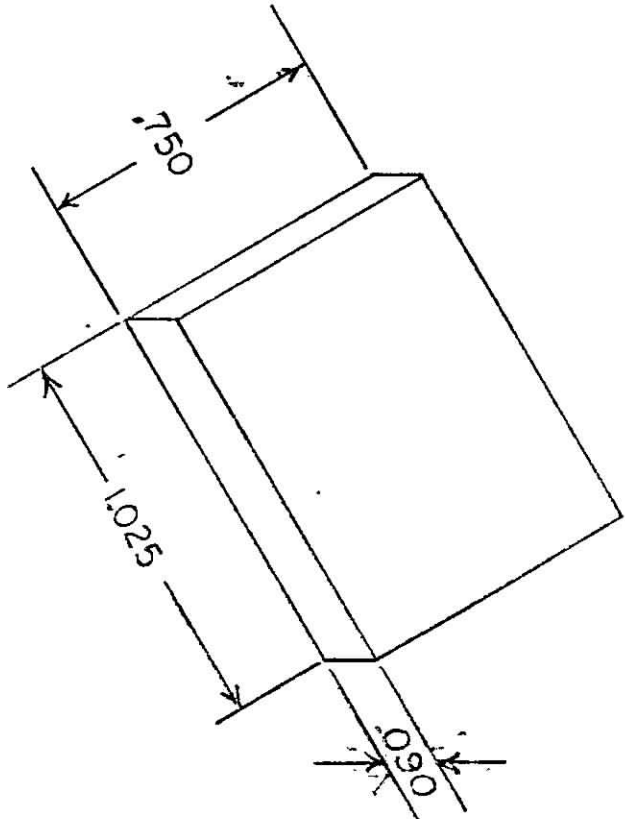
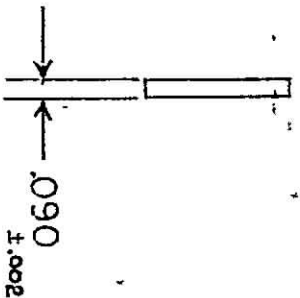
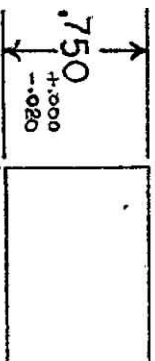
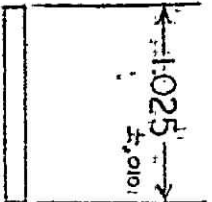
DECK PANEL - RIGHT UPPER

811D-103

DRAWING NUMBER PER
 110106

REVISIONS ONLY
 SYM DESCRIPTION
 A MATL WAS 3E2A
 B MATL WAS 3C4

DATE
 8/17/1
 1/4/14



OPPOSITE SIDES PARALLEL ±.001
 LARGE SIDES FLAT ±.001

STEPHENS ELECTRONICS, INC.

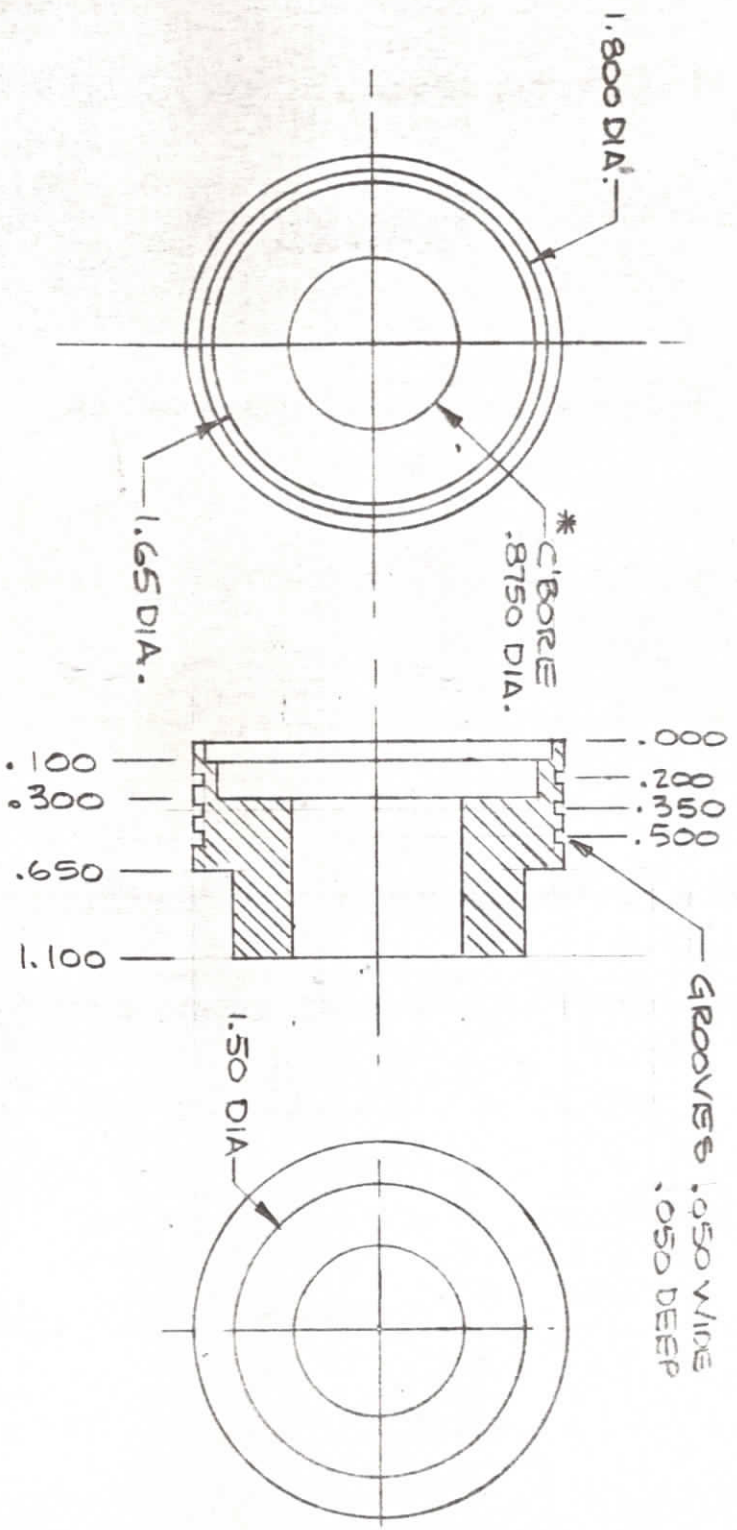
SCALE: FULL
 DATE: 1/21/72
 APPROVED BY: [Signature]
 DRAWN BY DMS
 REVISED

HEAD SHIELD CUBE

Q11D - 103

DRAWING NUMBER
 110138 A

MATL: INDIANA GENERAL OS OR EQUIV

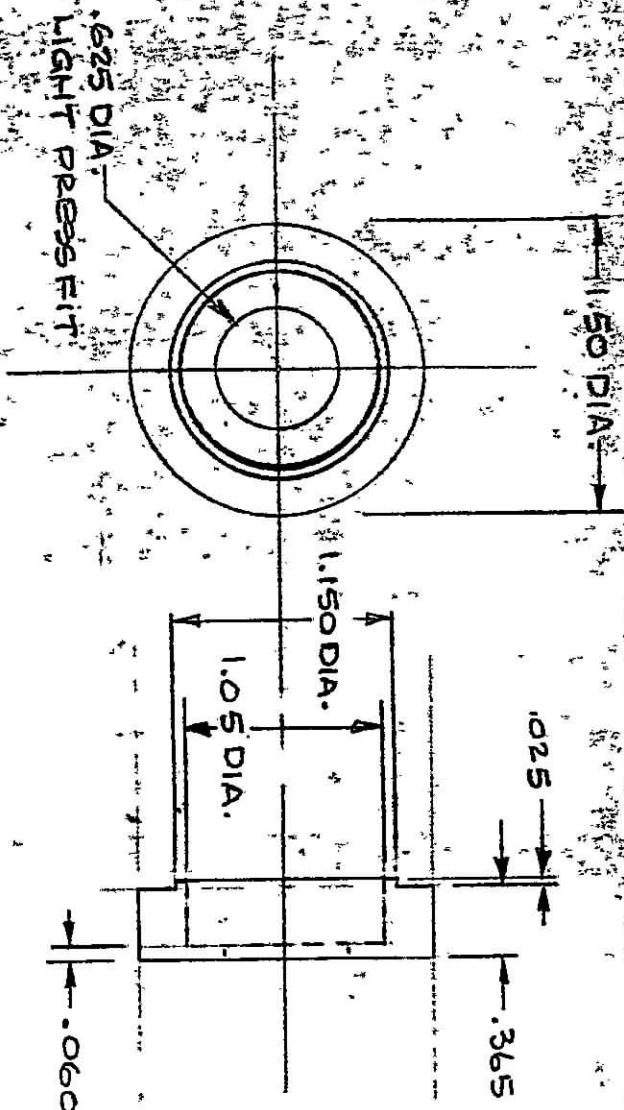


CONCENTRICITY $\pm .0002$
 FINISH: SANDBLAST O.D.
 REMOVE ALL BURS & ROUGH EDGES
 * HAND PRESS FIT TO SUPPLIED BEARING

MAT'L: 304 STAINLESS
 .XX = $\pm .010$.XXX = $\pm .005$ DIA. $\pm .0005$

STEPHENS ELECTRONICS, INC.

| | | |
|--------------------------|--------------|--------------------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: GELER |
| DATE: 6/27/74 | | REVISED |
| REVERSE TOLER - 1/2 INCH | | |
| 811D-103 | | DRAWING NUMBER 110187 |



MATERIAL: 6061-T6 ALUMINUM

TOLERANCES: XX = $\pm .010$ XXX = $\pm .001$

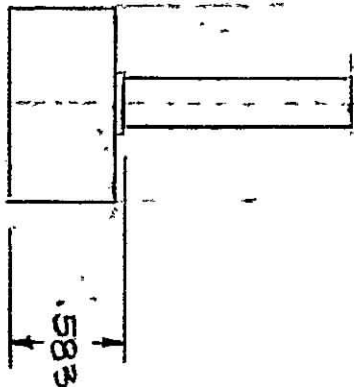
STEPHENS ELECTRONICS, INC.

| | | |
|--------------|---------------------------------|------------------------------|
| SCALE: FULL | APPROVED BY: <i>[Signature]</i> | DRAWN BY: <i>[Signature]</i> |
| DATE: 7/2/74 | | REVIEWED |

ADAPTER - REVERSE JDLB12

811 D-103

DRAWING NUMBER
110188



MAT'L: 3M 1" SHAFT
MODIFY EXISTING PART
AS SHOWN

STEPHENS ELECTRONICS, INC.

SCALE: Full

APPROVED BY:

DATE: 7/5/74

[Signature]

DRAWN BY: J. E. GIERA

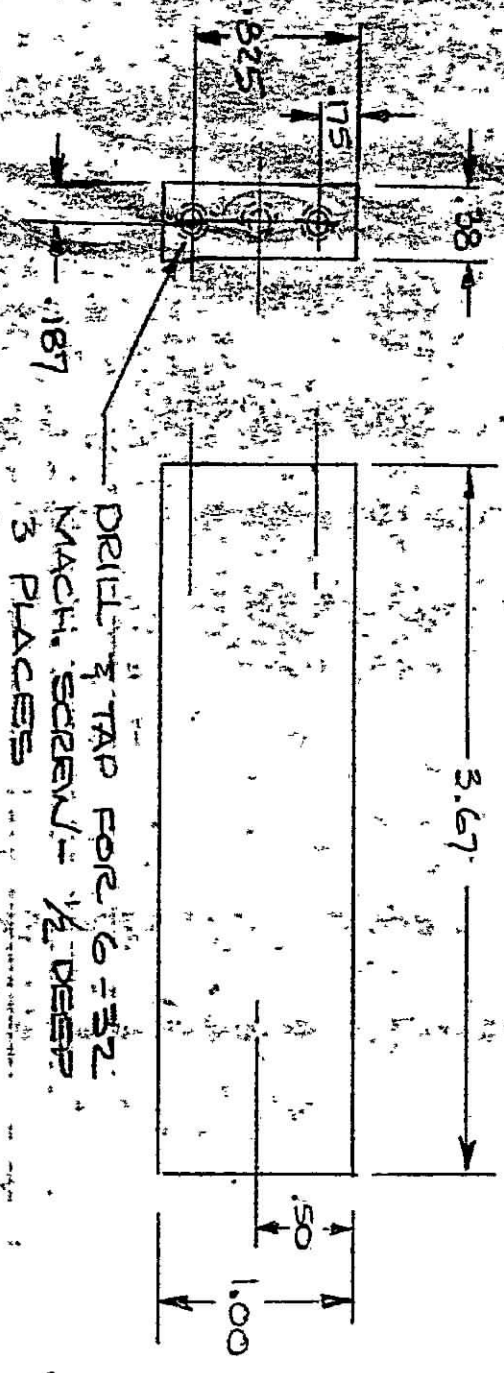
REVISED

MODIFICATION - SHAFT, REVERSE IDLER

DRAWING NUMBER

110189

REV.



MATL: 6061-T6 ALUM.
FINISH: ANODIZE

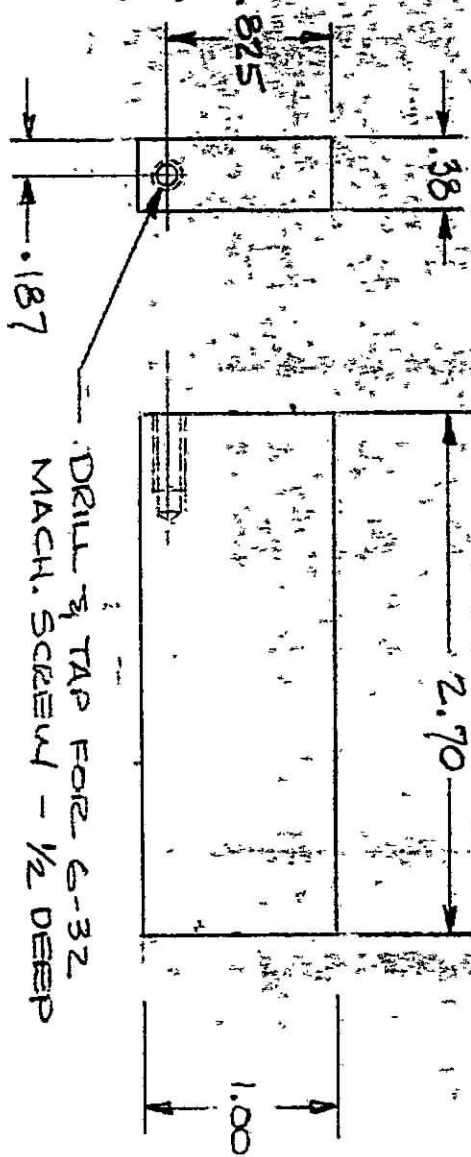
STEPHENS ELECTRONICS, INC.

| | | |
|---------------|--------------|--------------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: G. E. R. |
| DATE: 9/17/73 | | REVISED |

BRACKET
24/40 CENTER SUPPORT

MODEL BUD-103
DRAWING NUMBER 11015B-2

1 / BACK

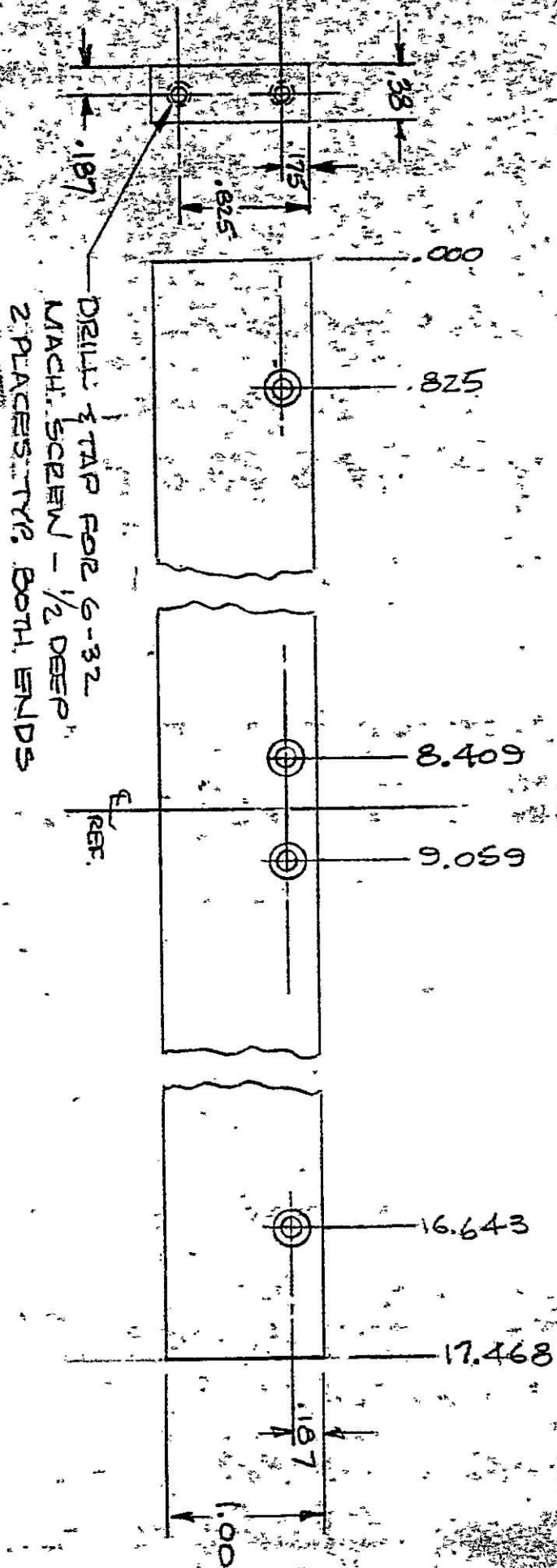


MAT'L: 6061-T6 ALUMIN.
FINISH: ANODIZE

STEPHENS ELECTRONICS, INC.

2 REAO/UNIT

| | | | |
|-------------------|--|-------------------------|--|
| SCALE: FULL | | APPROVED BY: | |
| DATE: 5/7/73 | | DRAWN BY: G. GER | |
| BRACKET - | | | |
| 24/40 END SUPPORT | | | |
| MODEL 8110-103 | | DRAWING NUMBER 110153-3 | |



MAT'L: 6061-T6 ALUM.
FINISH: ANODIZE

STEPHENS ELECTRONICS, INC.

SCALE: FIDELITY

APPROVED BY:

DRAWN BY GEORGE

DATE: 9/17/73

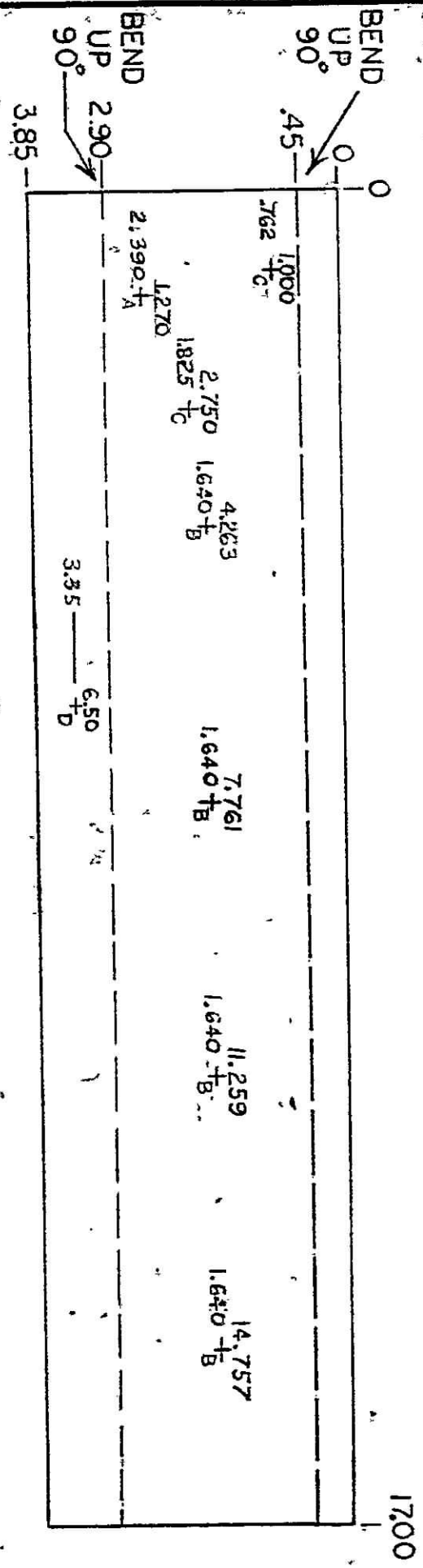
REVISED

BRACKET- 24/40 cross support

Model B11D-10A

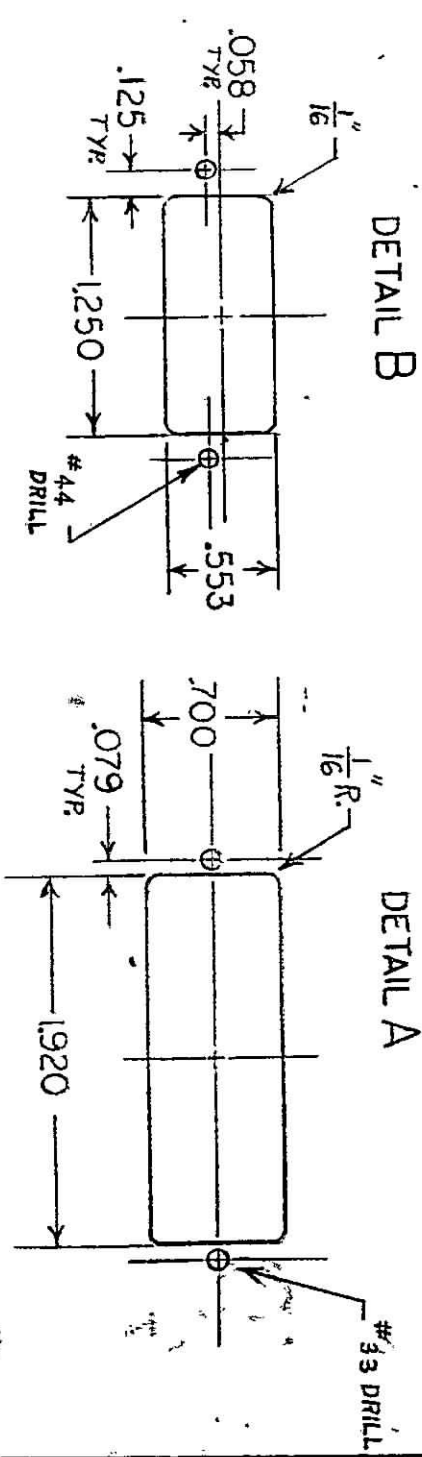
DRAWING NUMBER
110153-1

1/Deck



DETAIL B

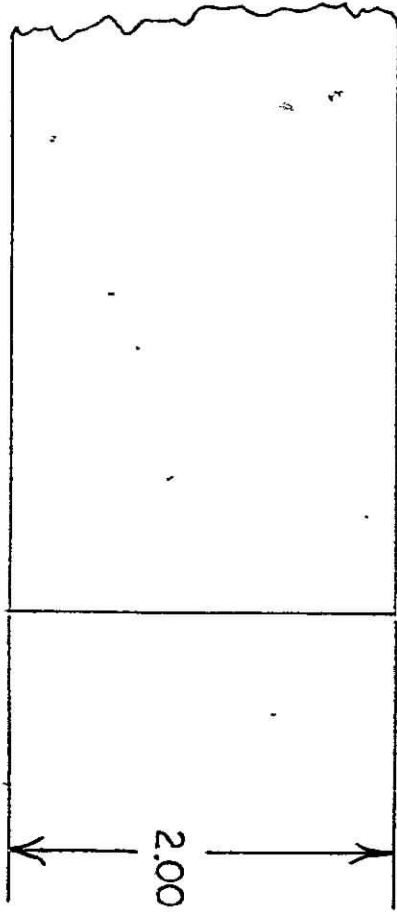
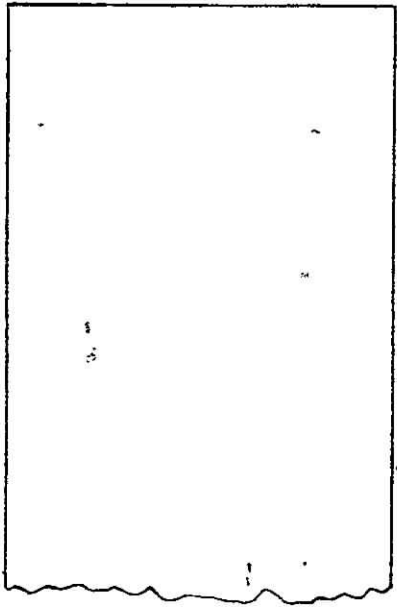
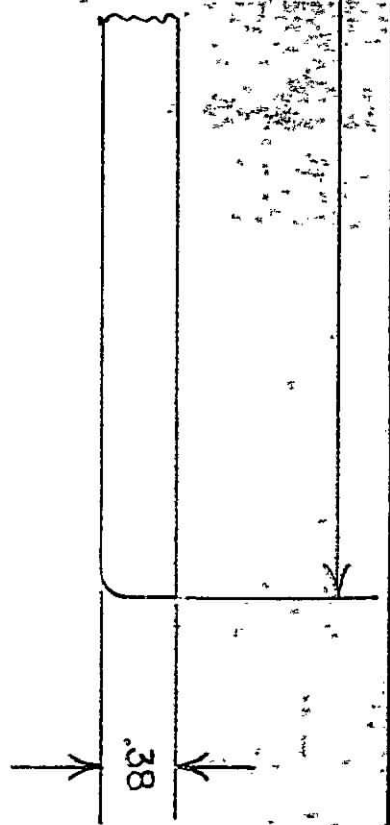
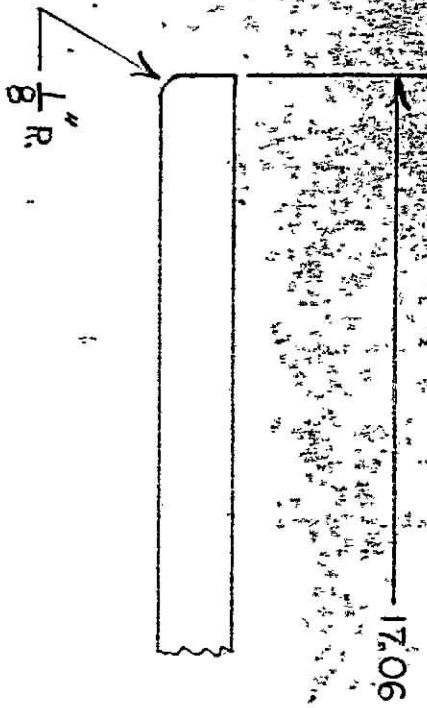
MAT'L .062 5052
 SHEAR SIZE 17.00 X 3.85
 .06 BR. K @ 90° = .110
 RADII:
 SMALL $\frac{1}{8}$ " R.
 LARGE $\frac{1}{4}$ " R.



- A - SEE DETAIL A
- B - SEE DETAIL B
- C - #27 DRILL
- D - 6-32 TAP

REMOVE ALL BURRS & ROUGH EDGES
 FINISH: AL-ODINIE

| | | | | | | | | | |
|--|--|-----------------------------|--|--------------|--|----------------------|--|------------------|--|
| REVISIONS SYM DESCRIPTION DATE A REMOVE CUTOUT FOR WIRES 6/22/72 | | SCALE: 1/2 DATE: 1/20/72 | | APPROVED BY: | | DRAWN BY: <i>DMd</i> | | REVISED: 6-18-70 | |
| STEPHENS ELECTRONICS, INC. | | | | | | | | | |
| CONNECTOR RAIL | | | | | | | | | |
| 811D-103 2/16 | | | | | | | | | |
| DRAWING NUMBER: 110131A | | | | | | | | | |



XX ± .015 MATL - 6061-T6

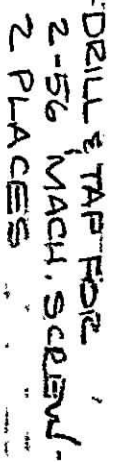
STEPHENS ELECTRONICS, INC.

| | | |
|---------------|--------------|---------------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY <i>amf</i> |
| DATE: 1/20/72 | | REVISED |

DECK SUPPORT BRACKET CROSS BAR

811D - 103 8/16 DRAWING NUMBER 110132

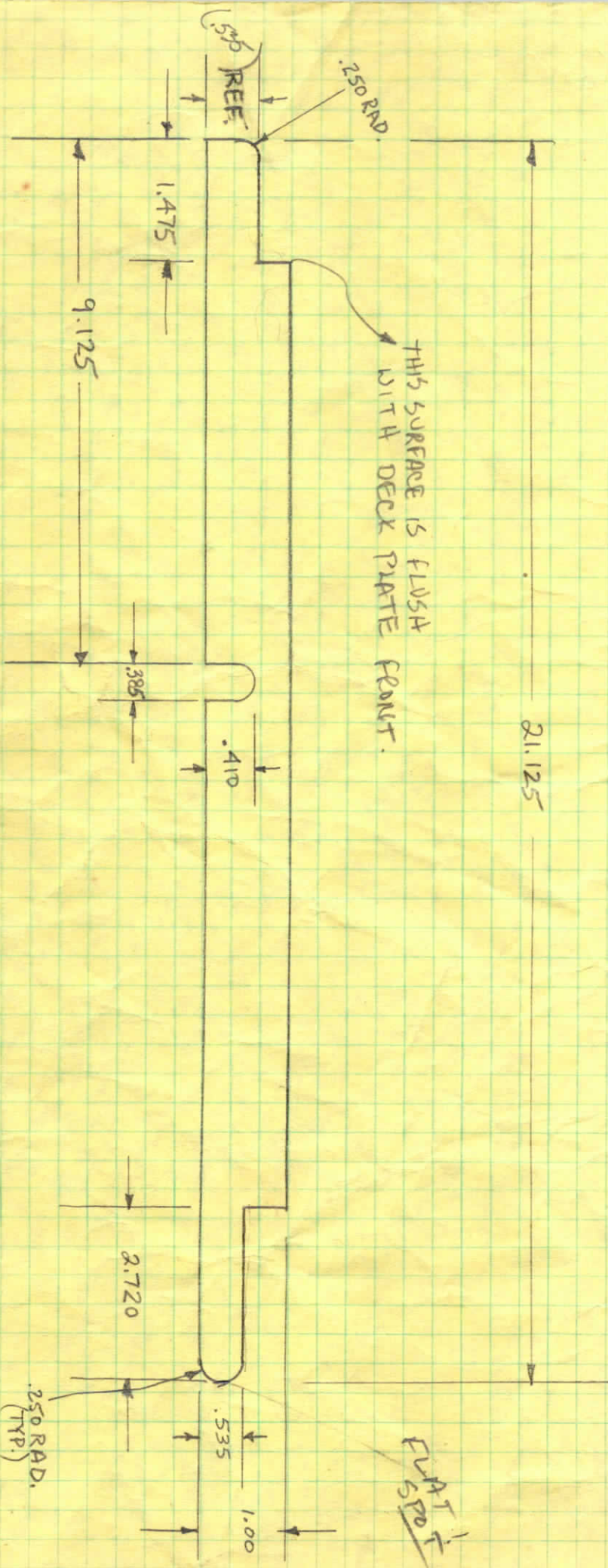
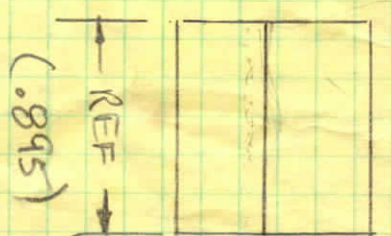
REMOVE ALL BURRS & ROUGH EDGES
TO BE ALCOINIS



XXXX
11.005

DRAWING NUMBER
110156

MATIC - 6061 ALUM. BAR
1" X 1"



FLUSH
5/8"

811D / 821A - 104-40 TRK ONLY
RAIL - CABINET MOUNTING

| REVISIONS | | |
|-----------|---|---------|
| SYM | DESCRIPTION | DATE |
| A | DELETED .36 DIA. HOLE CUT FROM .650 TO .815 | 2/2/74 |
| B | 1.130 WAS 1.115 | 3/24/74 |

DRILL & TAP FOR 6-32
MACH. SCREW THRU

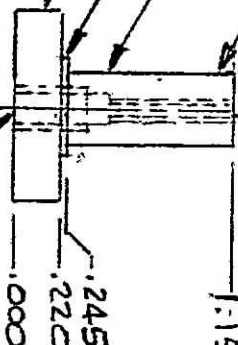
1.150

* .3747 DIA.

* .3747 DIA.

* .500 DIA.

* 1.00 DIA.



DRILL & TAP FOR 1/4-20
MACH. SCREW - .50 DEEP

MATERIAL: STAINLESS STEEL 303

XXXX ± .0005

XXXX ± .0005

XXX = ± .010

* SHIP FIT TO SUPPLIED BEARING

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DATE: 11/20/73

DRAWN BY GEB/BN

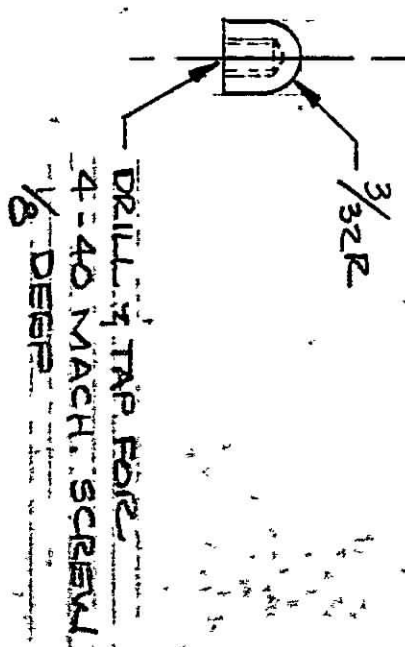
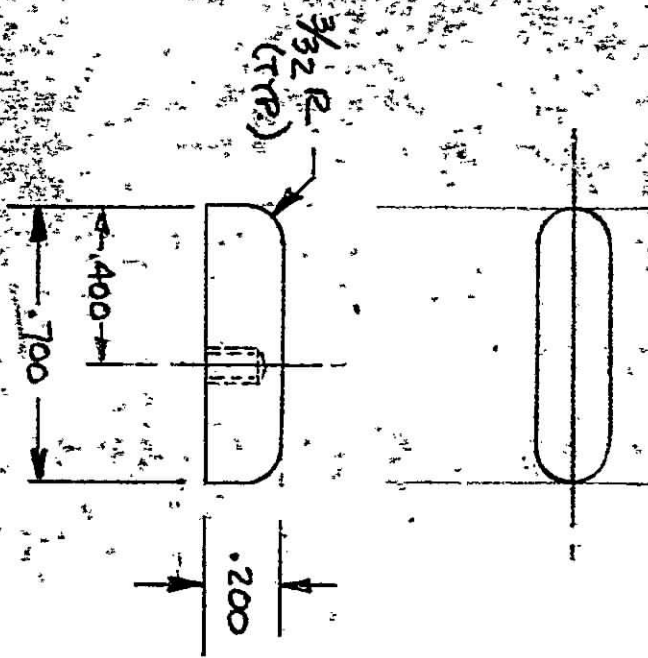
REVISED

SHAFT - REVERSE IDLER SUPPORT

MODEL 811D-103

1/2 INCH

DRAWING NUMBER REV
110170 B



MAT'L : ST. ST.

XXX = 1.005

STEPHENS ELECTRONICS, INC.

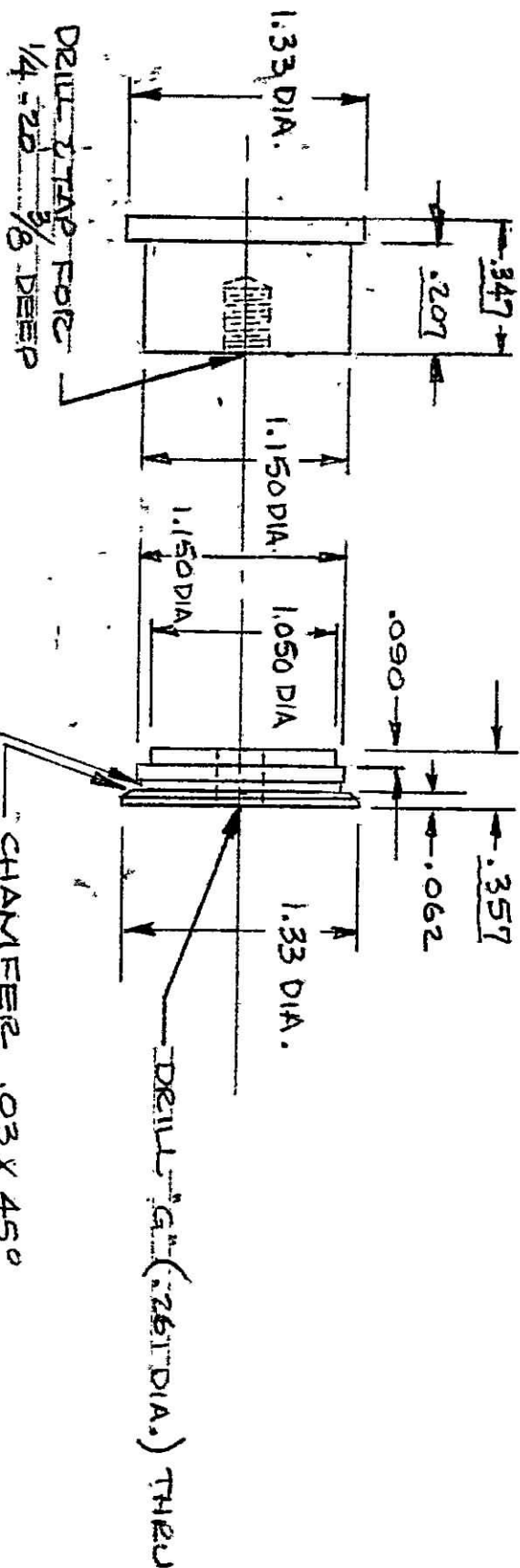
| | | |
|----------------|--------------|-----------------|
| SCALE: 2:1 | APPROVED BY: | DRAWN BY: GELER |
| DATE: 12/20/75 | | REVISED |

REEL GUIDE - HUB 1/2 TAP

811D-103

DRAWING NUMBER
110174

-1 CAP -2 POST



MATERIAL

-1 & -2 MAKE FROM 1.375 DIA. 303 S.S.

-3 TUBING 1.250 O.D. .035 WALL 304 S.S.

XX = ±.005 XXX = ±.001

STEPHENS ELECTRONICS, INC.

SCALE: NONE

APPROVED BY:

DATE: 2/15/74

DRAWN BY: GELER
REVISED

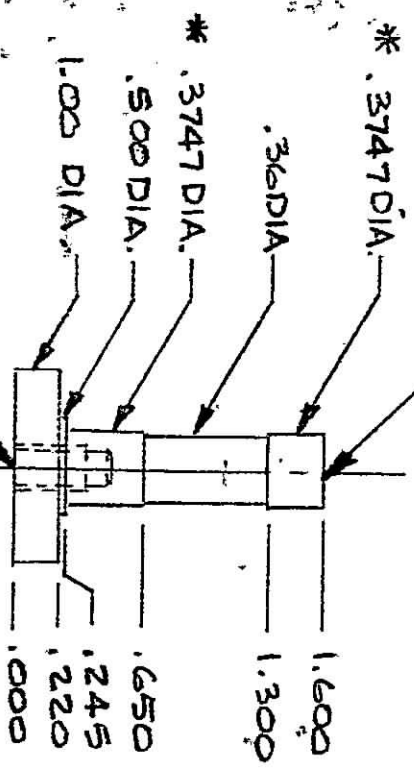
COMPENSATING GUIDE ASSY - 1/2" TAP

811 D-103

DRAWING NUMBER
REV. 110179

DRILL & TAP FOR 6-32
MACH. SCREW - .50 DEEP

DRILL & TAP FOR 1/4-20
MACH. SCREW - .50 DEEP



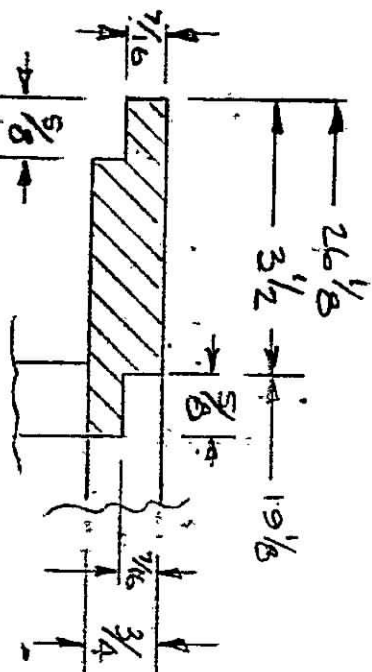
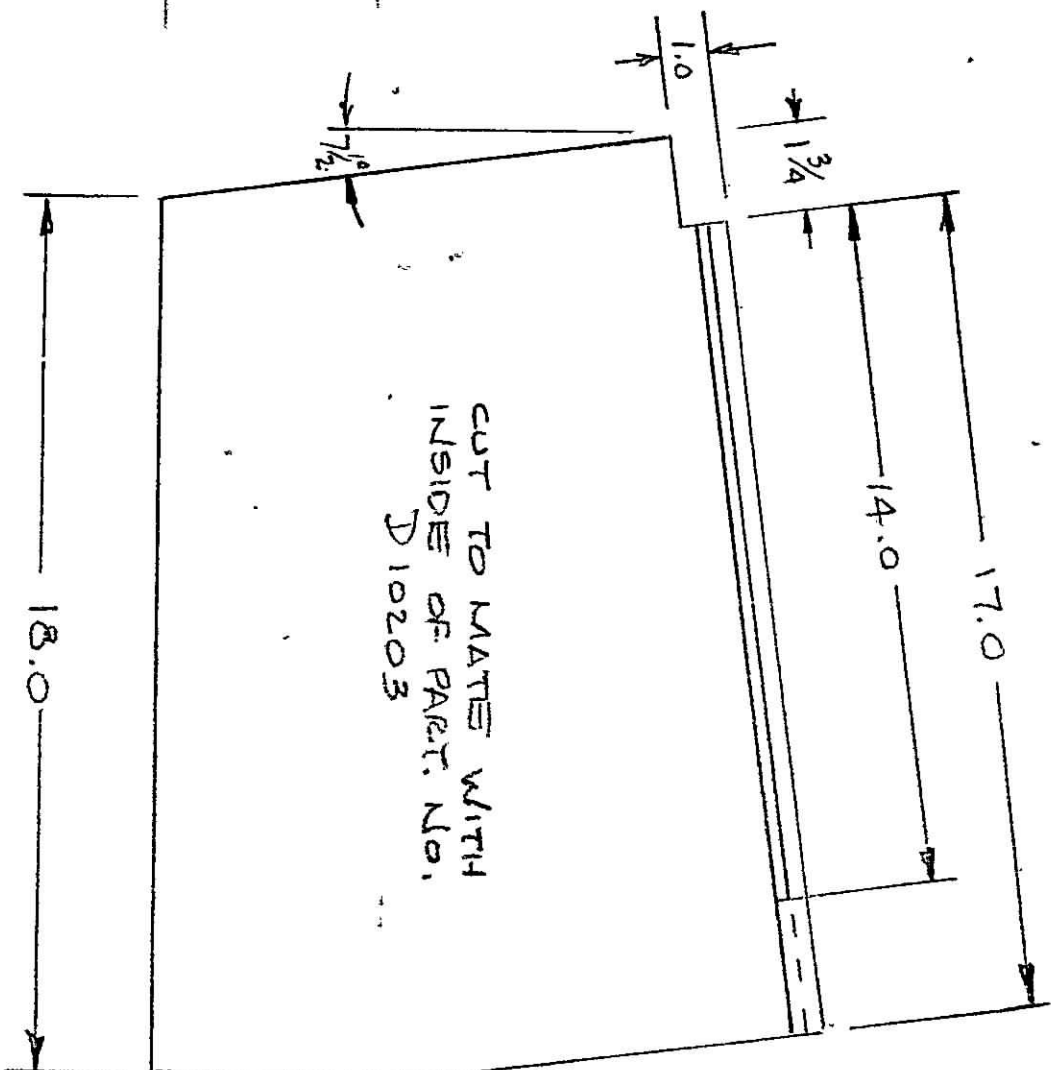
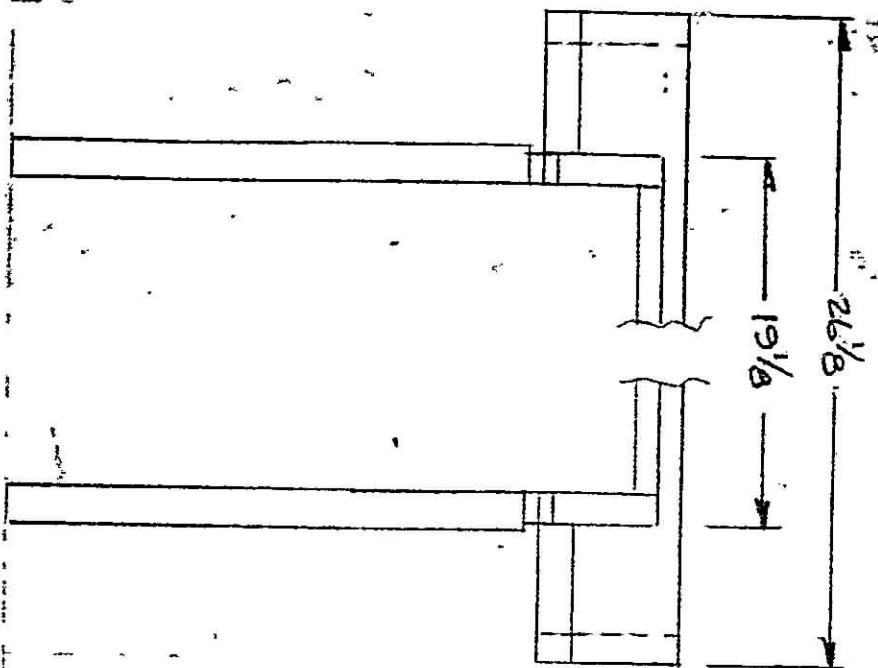
MATERIAL: 303 STAINLESS

TOL: .XX = $\pm .010$, .XXX = $\pm .005$

STEPHENS ELECTRONICS, INC.

* INDICATES TOL. $\pm .0001$
--.0002

| | | | |
|--|--|------------------------|--|
| SCALE: FULL | | APPROVED BY: | |
| DATE: 11/17/80 | | DRAWN BY: G151512 | |
| SHAFT - REVERSE IDLER SUPPORT - 1 INCH | | REVISED | |
| 811D-103 | | DRAWING NUMBER: 110201 | |



L.H. FILTER SECTION SHOWN
R.H. OPPOSITE

3/4 PLYWOOD TYPE

STEPHENS ELECTRONICS, INC.

SCALE: 1/4" = 1/2"

APPROVED BY:

DATE: 11/6/73

DRAWN BY G. GIER

REVISED

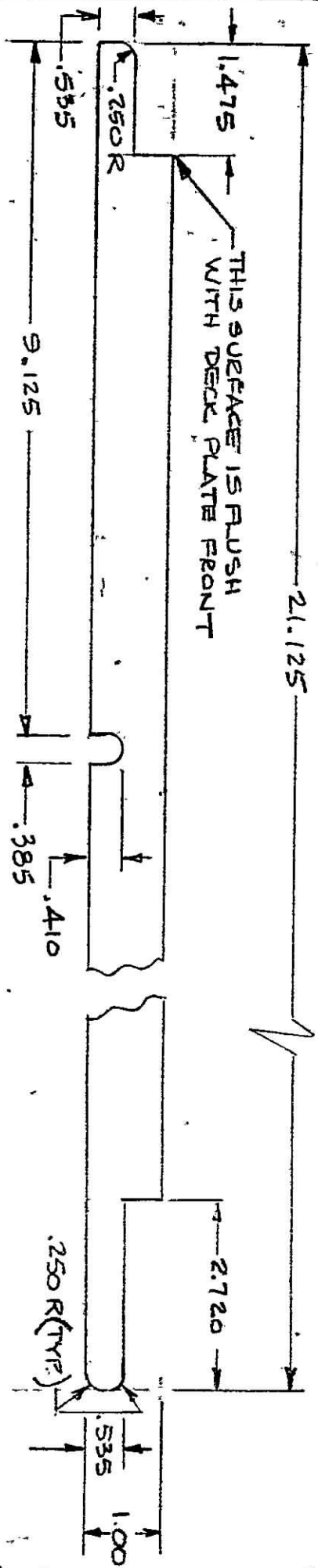
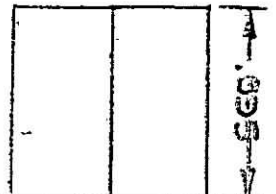
ADAPTER - 14" TO 10 1/2" REEL DECK PLATE

MODEL 811D - 104/103

DRAWING NUMBER

REV. 110204

END VIEW
ACTUAL SIZE



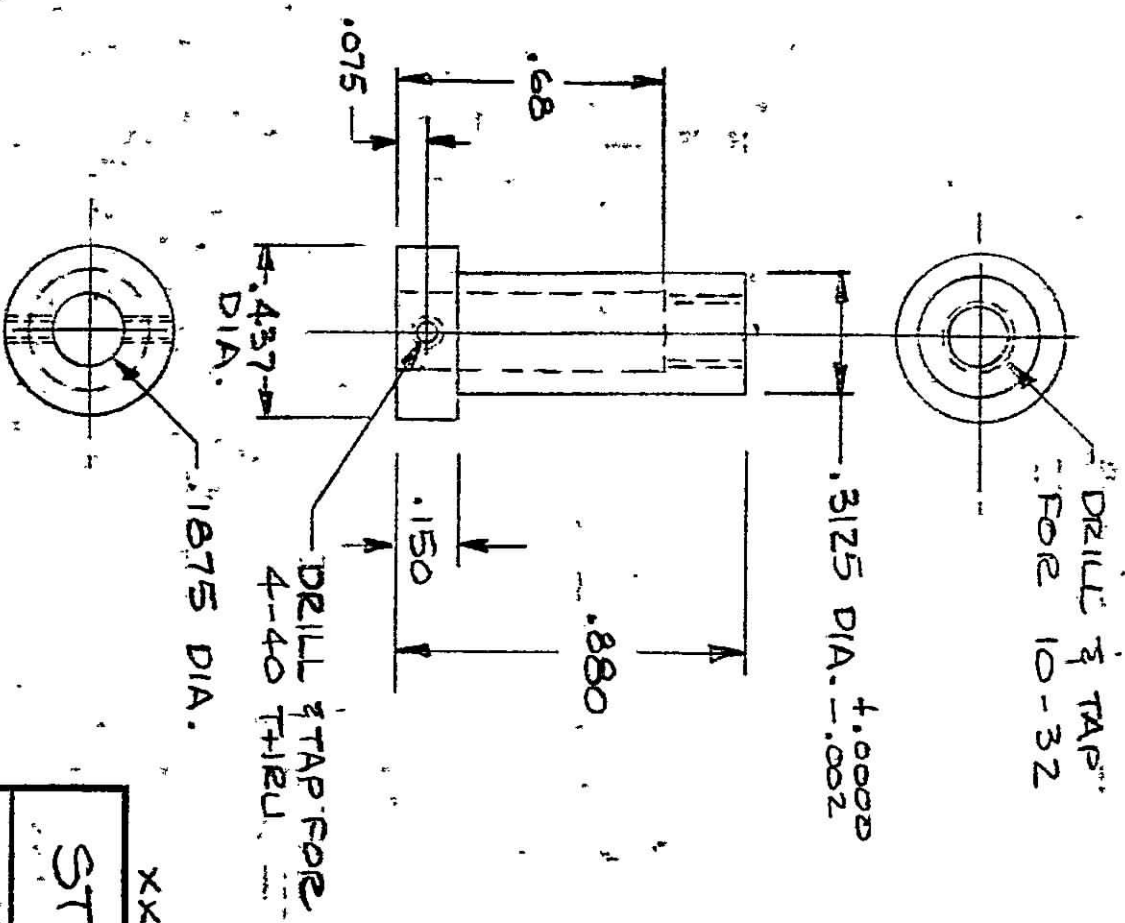
THIS SURFACE IS FLUSH
WITH DECK PLATE FRONT

MAT'L: 1X1 ALUM BAR 6061

STEPHENS ELECTRONICS, INC.

| | | | |
|--------------------------------|--|------------------------|--|
| SCALE: 1/2 | | APPROVED BY: | |
| DATE: 9/18/77 | | DRAWN BY: GED | |
| RAIL - CABINET MOUNTING | | | |
| MODEL 811D/821A-104 40TRK ONLY | | DRAWING NUMBER: 110214 | |
| REV | | REV | |

| REVISIONS | | |
|-----------|--------------------|---------|
| SYM | DESCRIPTION | DATE |
| A | ADDED BEARING TOL. | 6/11/72 |
| | | |



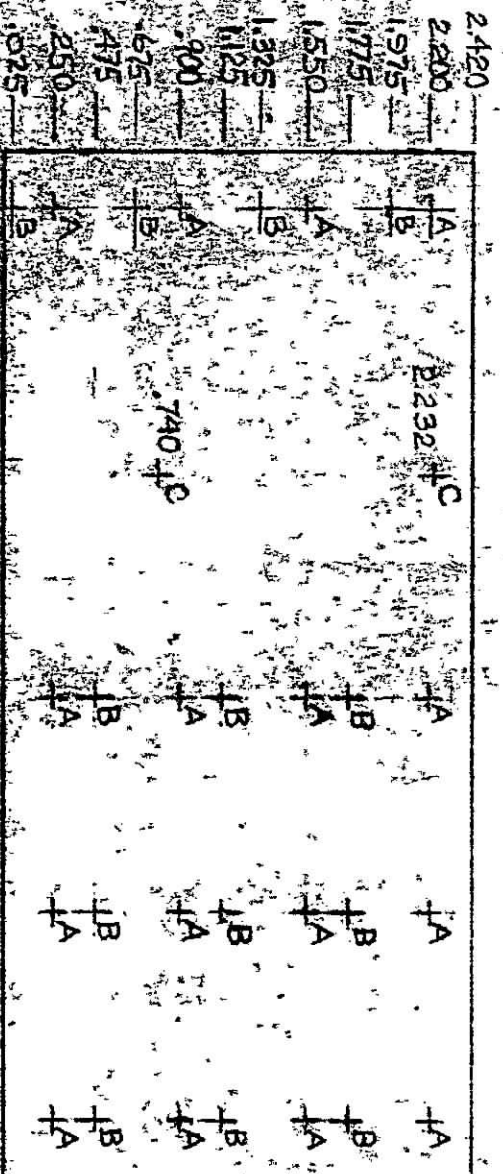
MAT'L: ALUM. 6061-T6
FINISH: ALODINE

XXX = ±.005

STEPHENS ELECTRONICS, INC.

| | | |
|--------------------------------------|-------------------------|---------------------|
| SCALE: 2:1 | APPROVED BY: | DRAWN BY: G.E. GIER |
| DATE: 1/20/72 | | REVIEWED: |
| SHAFT-TAPE LIFTER SUPPORT BRACKET | | |
| 811D-103 | DRAWING NUMBER: 110128A | |

| SYM | DESCRIPTION | DATE |
|-----|--|---------|
| B | CORRECTION - 1" B HOLES ON 30 & WEBS - 475 1.135 & 1.175 | 10/1/74 |



MAT'L - .025 THK, 6061-T6 .XXX ± .005

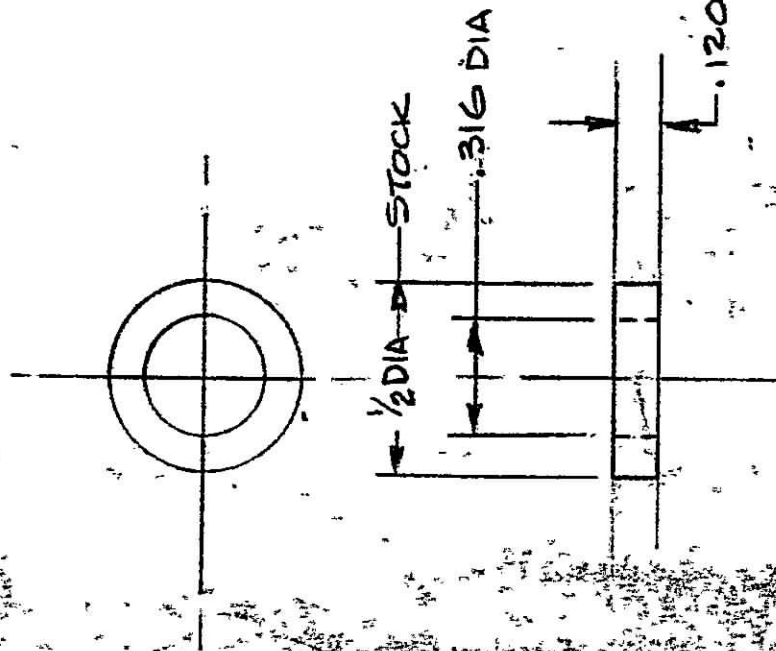
- A .250 DIA
- B .125 DIA
- C .375 SQUARE

STEPHENS ELECTRONICS, INC.

| | | |
|---------------|--------------|---------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: SRS |
| DATE: 3-20-73 | | REVIEWED: |

BACK PLATE FOR BUD-4300 CHASSIS

DRAWING NUMBER:
110946 B



MAT'L: ALUM 6061-T6
FINISH: ALODINE

XX X = ±.005

STEPHENS ELECTRONICS, INC.

APPROVED BY:

SCALE: 2:1

DRAWN BY: GEIER

DATE: 4/26/72

REVISED

SPACER - TAPE LIFTER SHAFT

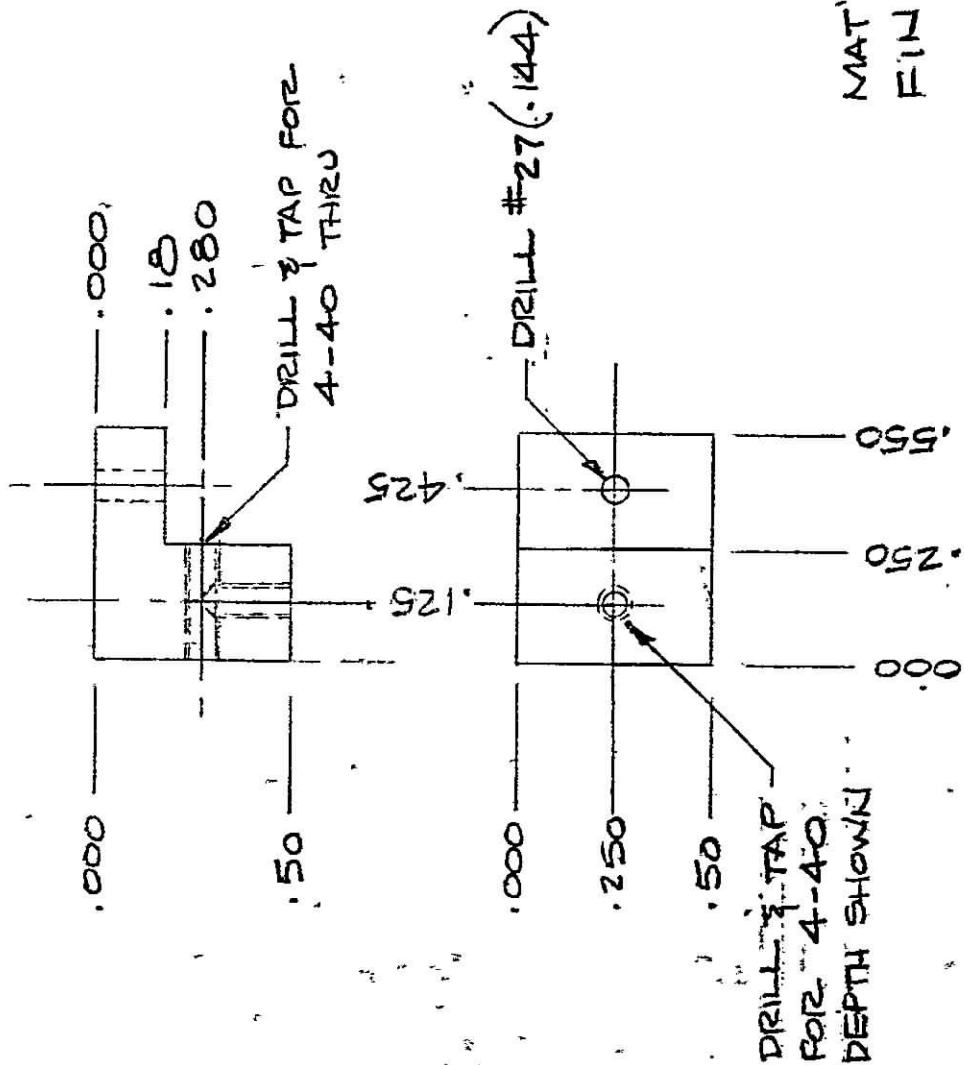
811 D-103

DRAWING NUMBER
110146

2 REQ'D / DECK

REVISIONS

| SYM | DESCRIPTIONS | DATE |
|-----|--|---------|
| A | .125 WAS .150, .425 WAS .45, .250 WAS .300, .550 WAS .60 | 3/27/74 |



MAT'L: ALUM 6061-T6
FINISH: ALODINE

STEPHENS ELECTRONICS, INC.

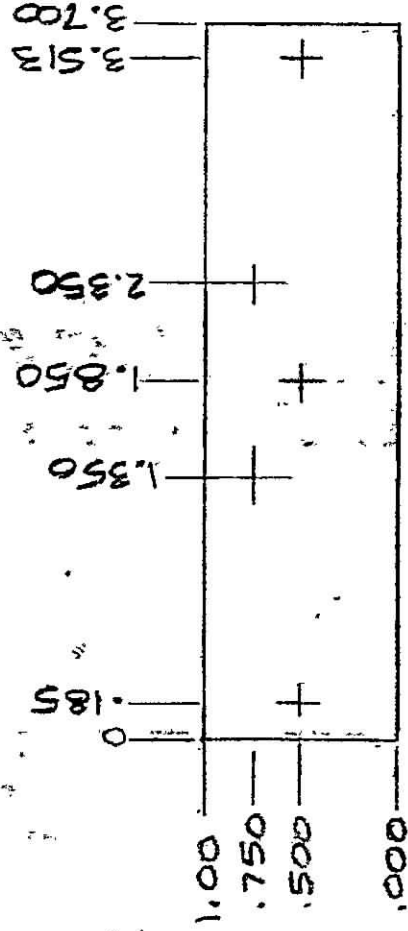
| | | |
|---------------|---------------------------------|-----------------|
| SCALE: 2:1 | APPROVED BY: <i>[Signature]</i> | DRAWN BY: GEIER |
| DATE: 1/19/72 | | REVISED |

BRACKET-SOLENOID MOUNTING

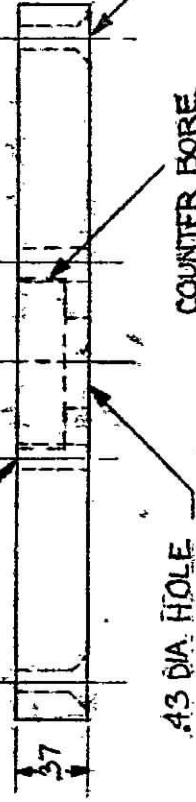
| | |
|----------|--------------------|
| 811D-103 | DRAWING NUMBER REV |
| | A10127A |

11 REED/DECK

| REVISIONS | | |
|-----------|-------------------------------------|-------|
| S/N | DESCRIPTION | DATE |
| A | 1.850 WAS 1.849 ADDED 4-40 HOLES | 12/72 |



DRILL & TAP FOR
4-40 - 2 PLACES



COUNTER BORE
.875 DIA.
.25 DEEP

DRILL #30 & .225 DIA X .875
C/SINK FOR 4-40 SCREW
2 PLACES

MATCH TO BEARING

FINISH: ALODINE

MAT'L - ALUM 6061-T6

STEPHENS ELECTRONICS, INC.

APPROVED BY:

DRAWN BY SRS

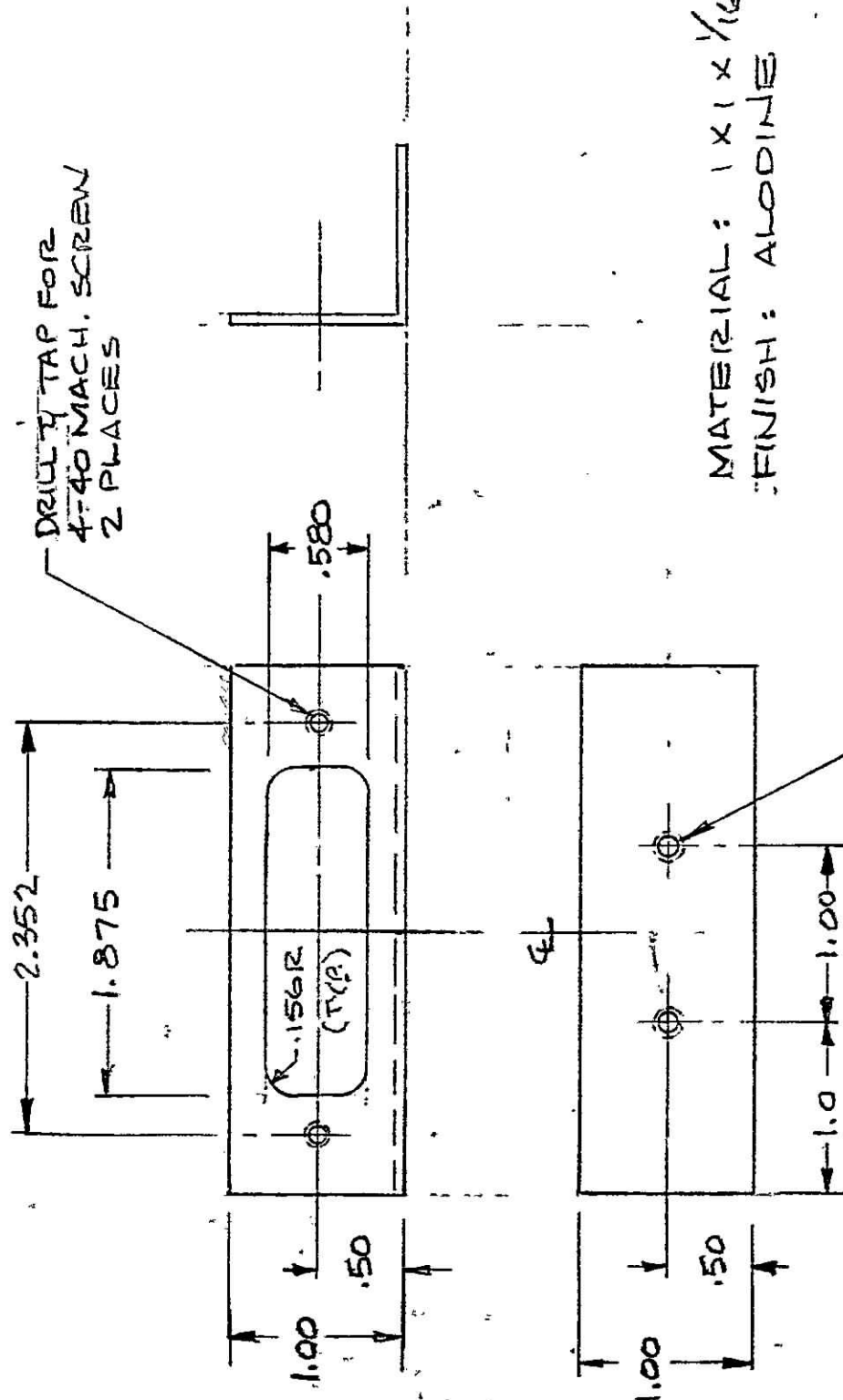
REVISED

SCALE: FULL
DATE: 3-10-73

BEARING SUPPORT PLATE - REEL MOTOR

DRAWING NUMBER REV.

110160 A



MATERIAL: $1 \times 1 \times \frac{1}{16}$ ALUM. EXTRUSION
FINISH: ALODINE

STEPHENS ELECTRONICS, INC.

| | | |
|----------------|--------------|----------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: GIER |
| DATE: 10/16/73 | | REVISED |

BRACKET - CONNECTOR MOUNTING

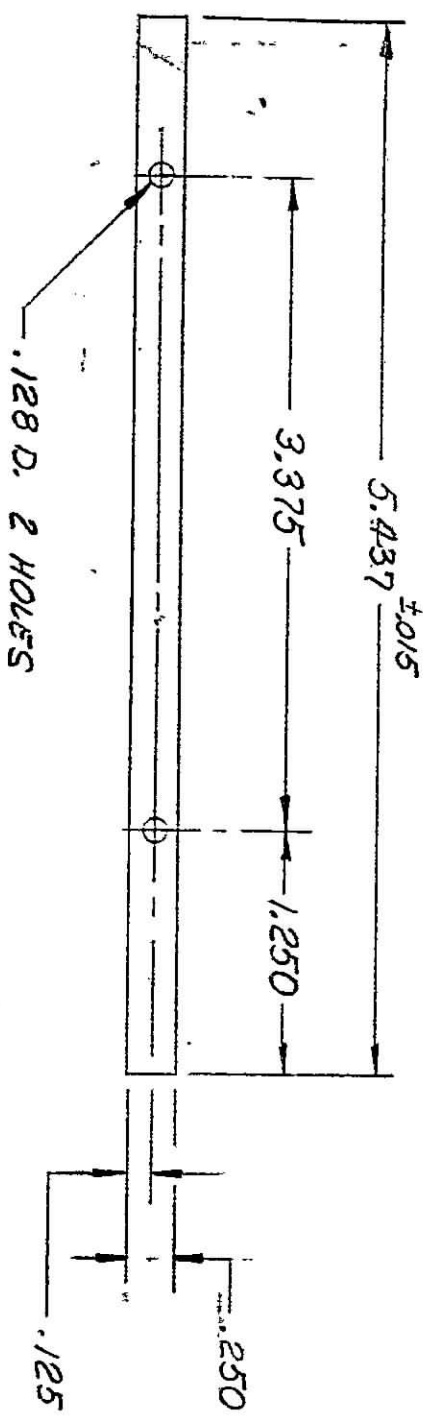
MODEL 811 D-103

DRAWING NUMBER
110166
REV

DRILL & TAP FOR
6-32 MACH. SCREW
2 PLACES

1/DEK

REVISIONS
 A REMOVED 30° CUT
 5.437 WAS 5.312
 3/30/84



NOTES:

1. MATL: 1002 THK 5052-H34
2. FINISH: ALODINE #1200 OR IEIDITE
3. BREAK ALL SHARP EDGES

2 REQ/UNIT

XX = ±.02
 .XX = ±.010

TAPE GUIDE

STEPHEUS ELECTRONICS
 BUEBAUK, CALIF 842-5116

DESIGN: A. D. DUNN
 SCALE: FULL SCALE

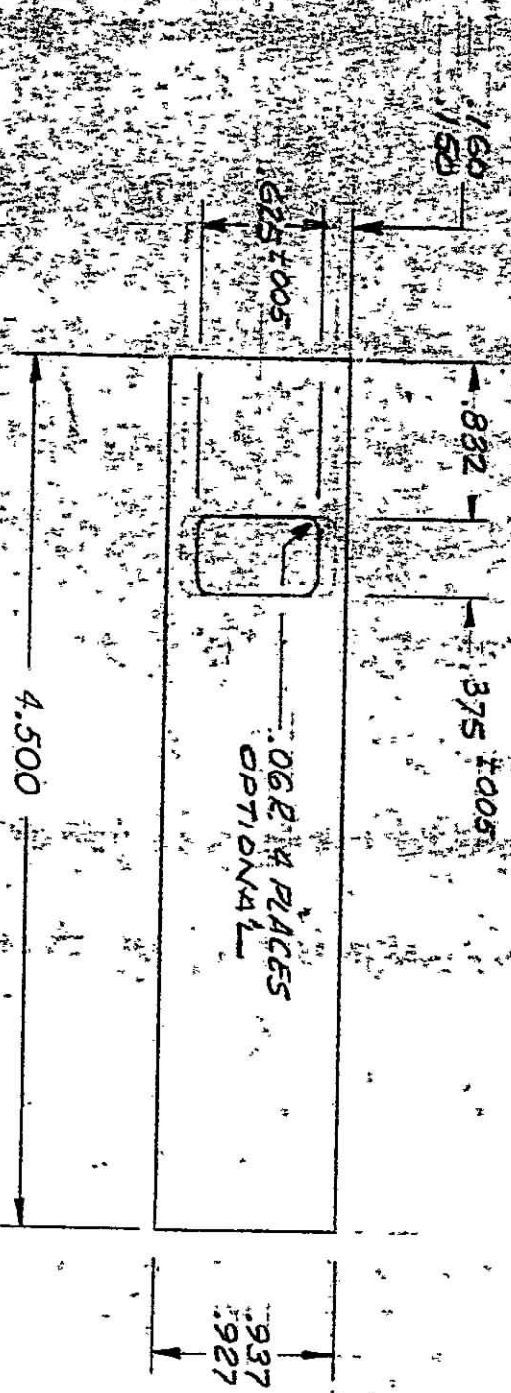
1300029

REV

REVISIONS

A. DIMENSIONS GIVEN

.832 WAS .820; .375 WAS
 .400; .625 WAS .600; .160
 WAS .068
 .063



MATL. .032 THK 2024-T3 OR 6061-T6 AL
 FINISH: PEEBASS & PAINT FLAT BLACK

MASK PLATE

STEPHEN ELECTRONICS
 BUEBAK, CALIF. 842-5116

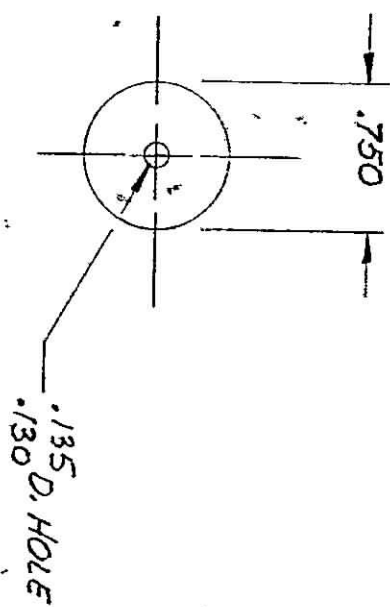
DESIGN: W. Dunnell 1/16/65
 FULL SCALE

1 REQ/UNIT

150030

A

REVISIONS
 A HOLE SIZE WAS $\frac{1}{16}$ 3/64 INCH



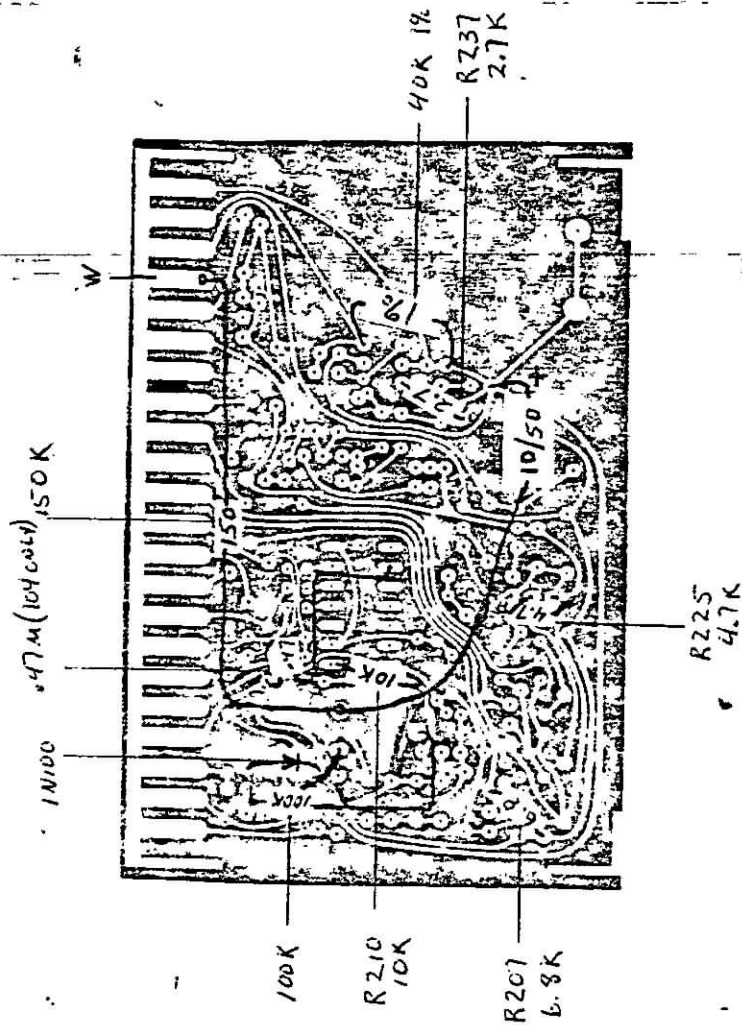
MATERIAL .018 THK TEFLON SHEET

SLIDING WASHER
 STEPHENS ELECTRONICS
 BUEBAUL, CALIF. 842-5116
 FULL SCALE

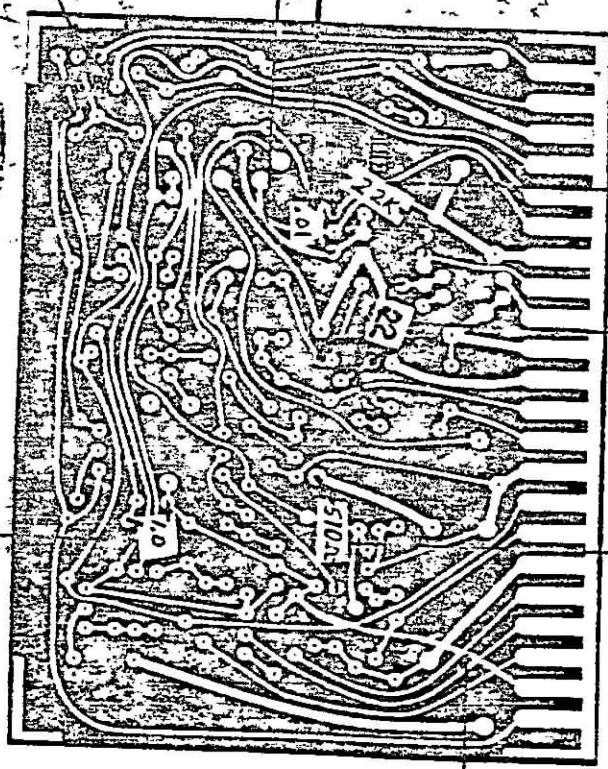
130031 A
 REV

5/17/76

#310164
-103-104



103- NO 47M CAP.
104- ADD 47M CAP.

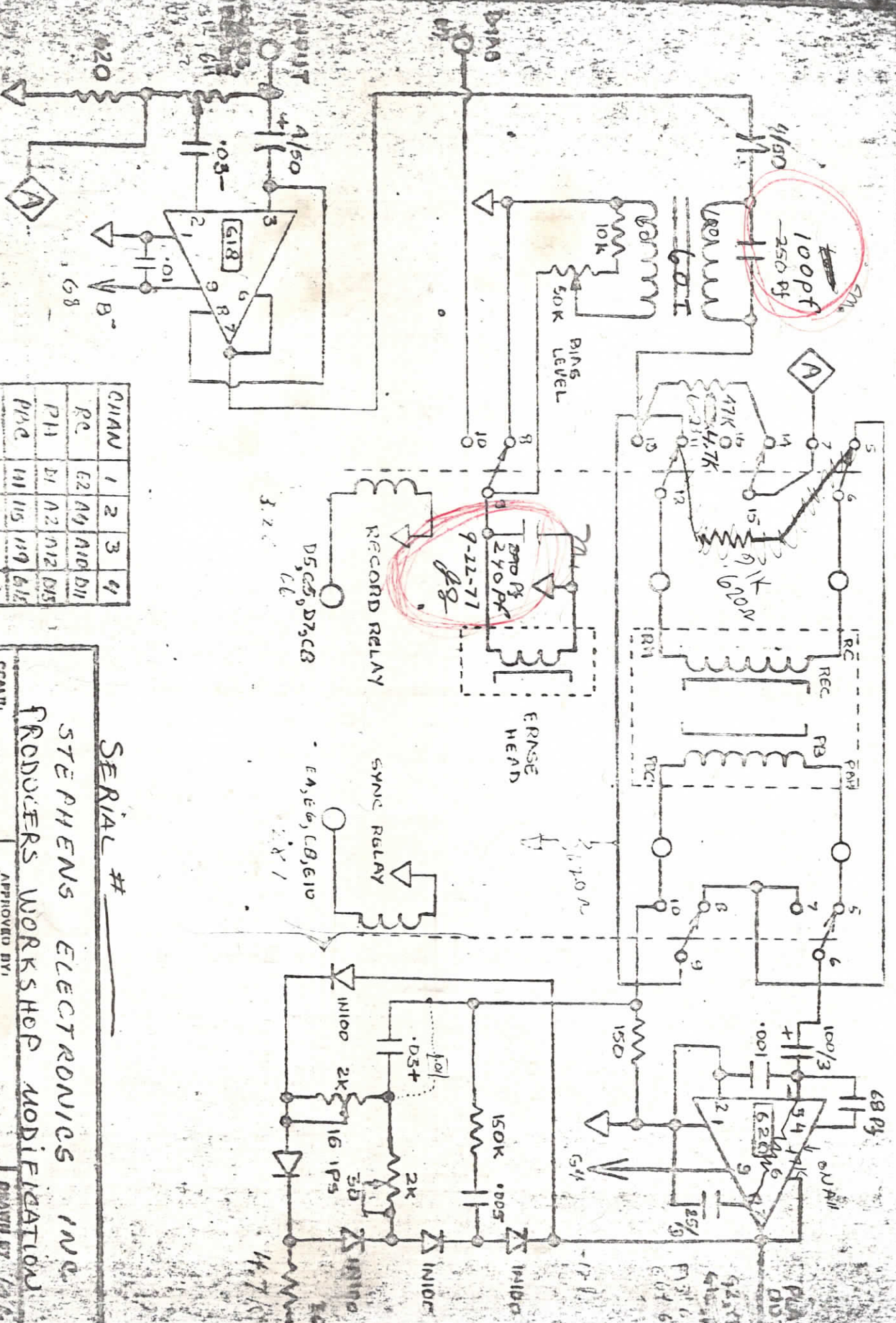


ON 10-1
ADD 1W10P

10-1
C112

JUMPER

811D-103



| CHAN | 1 | 2 | 3 | 4 |
|------|----|----|-----|-----|
| RE | E2 | A9 | A10 | D11 |
| PH | D1 | A2 | A12 | D13 |
| PP | H1 | H5 | H9 | A14 |
| PP | H1 | H5 | H9 | A14 |
| PP | H1 | H5 | H9 | A14 |
| E | D3 | A6 | A8 | D9 |

AMPLIFIER COMB.
IN AMPLIFIERS
CONTROL SIGNAL
AND STAGE

SERIAL # _____

STEPHENS ELECTRONICS INC.
PRODUCERS WORKSHOP MODIFICATION

APPROVED BY: _____
DATE: 6/6/75

HIGH BIAS FREQ
250 KHz

PRE AMP ELECTRONICS 9/20

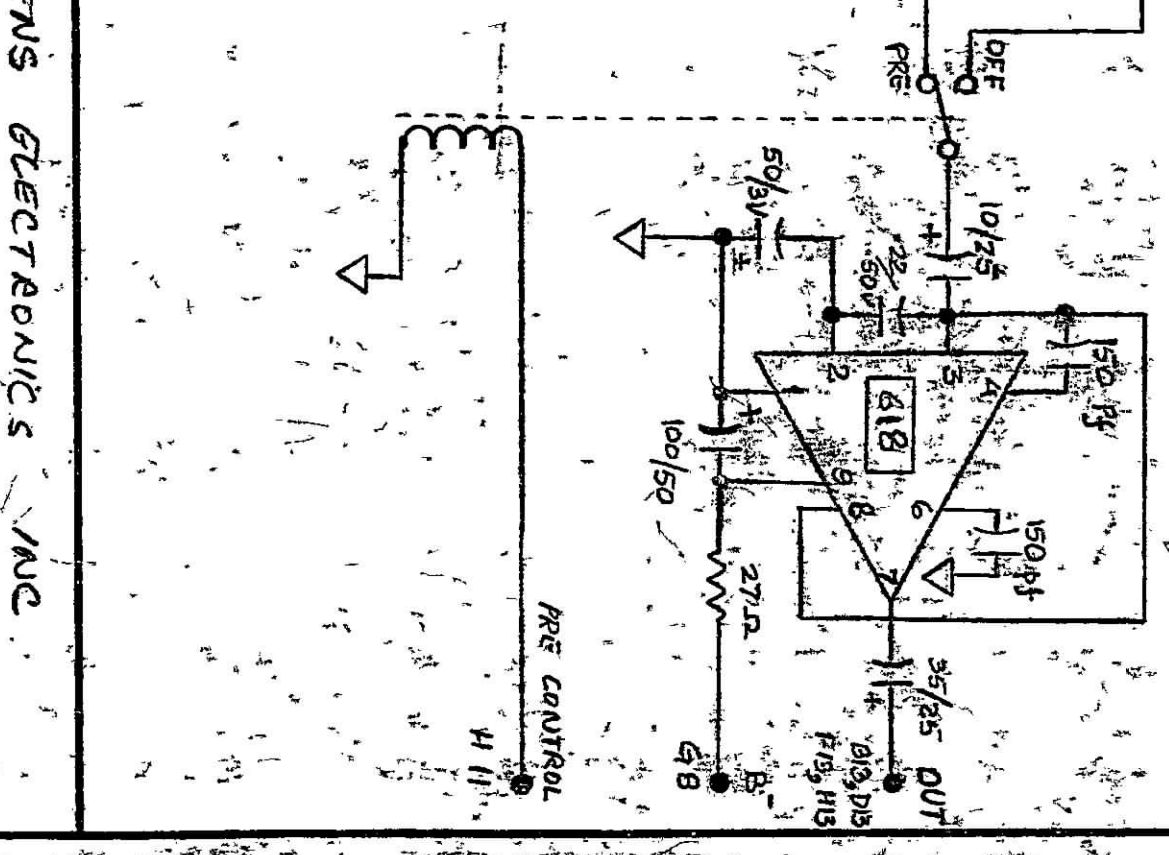
811-D 3/100

DRAWING NUMBER
110915

DRAWING NUMBER

DRAWING NUMBER
110932-B

—



7

| | |
|--------------------------|--------------------------|
| STEPHENS ELECTRONICS INC | |
| SCALE: 1 | APPROVED BY: |
| DATE: 5-30-75 | DRAWN BY: <i>Walt</i> |
| | REVISED |
| 4300 LINE ANALYZER CARD | |
| FOR 811-D ELECTRONICS | DRAWING NUMBER: 110932-A |

A10, E10, E10, G10
TO SEL SYNC SWITCH FOR OUT PHASE SELECT
B5, D7, E8, H7

PLAY INPUT
A6, C6, E6, H5
P.B. LEVEL
5K
35/25V

TO REC AMP
A2, C2, D3, G2

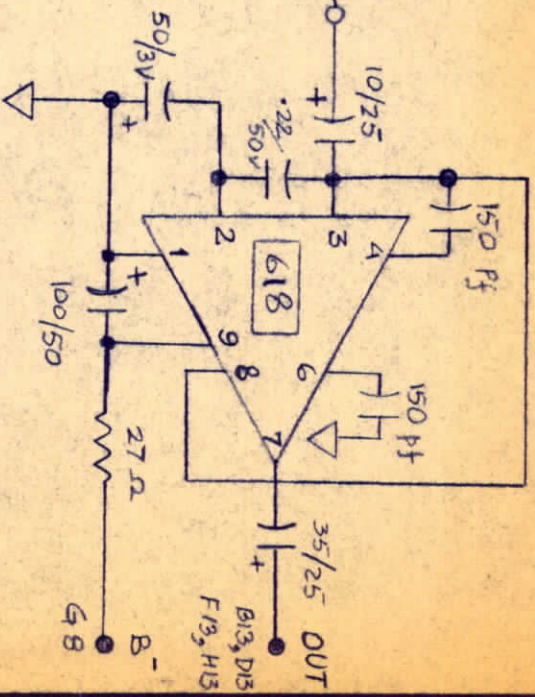
REC INPUT
B1, D1, H1, E2

REC LEVEL
25K
10K CW
DISTORTION TRIM

30 IPS CONTROL IN
G12

5K
CCW
PLAY L.F. EQ

OFF
PRE



PRE CONTROL
H11

NOTES

- 1 BOTH RELAYS ARE ENERGISED
- 2 RELAYS ARE COMMON TO ALL CHANNELS
- 3 PIN NUMBERS ARE FOR GREEN AMPHEND CONNECTORS
- 4 ALL RESISTOR VALUES ARE 1/4 WATT

STEPHENS ELECTRONICS INC

SCALE: —

DATE: 5-30-75

APPROVED BY:

DRAWN BY: lal

REVISED

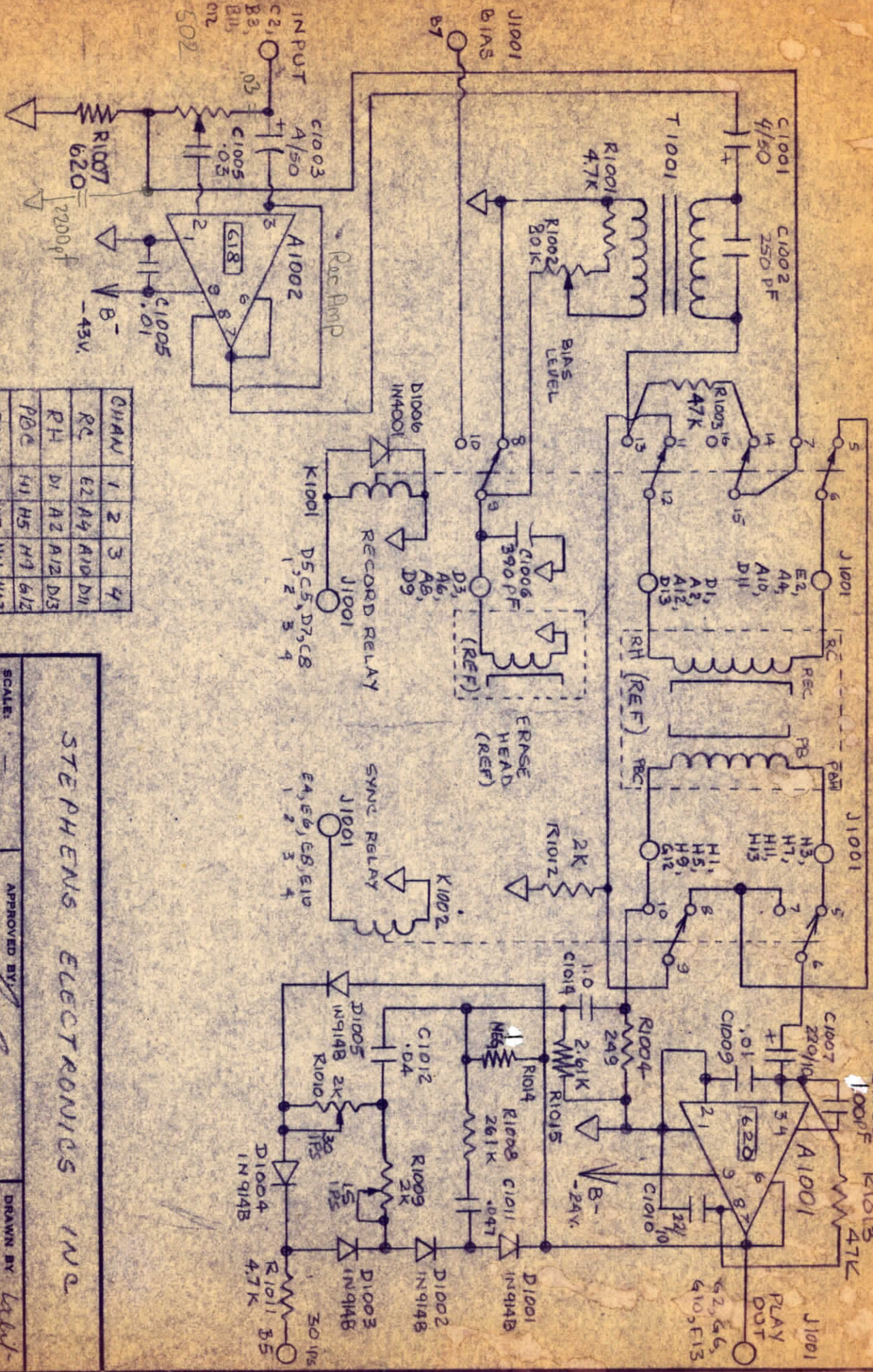
4300 LINE AMPLIFIER CARD

FOR 811-D ELECTRONICS

DRAWING NUMBER

110932-A

502



| CHAN | 1 | 2 | 3 | 4 |
|------|----|----|-----|-----|
| RC | E2 | A4 | A10 | D11 |
| RH | D1 | A2 | A12 | D13 |
| PBC | H1 | H5 | H7 | H13 |
| PBH | H3 | H7 | H11 | H13 |
| E | D3 | A6 | A8 | D9 |

ALL RESISTORS 1/4 WATT
ALL CAPACITORS 50 VOLT AND
IN MICROFARADS UNLESS OTHERWISE
NOTED

AMPLIFIER COMM.
PIN NUMBERS
CARRYING SIGNAL
TO HEAD STACK

STEPHENS ELECTRONICS INC

SCALE: -

DATE: 6/6/75

APPROVED BY:

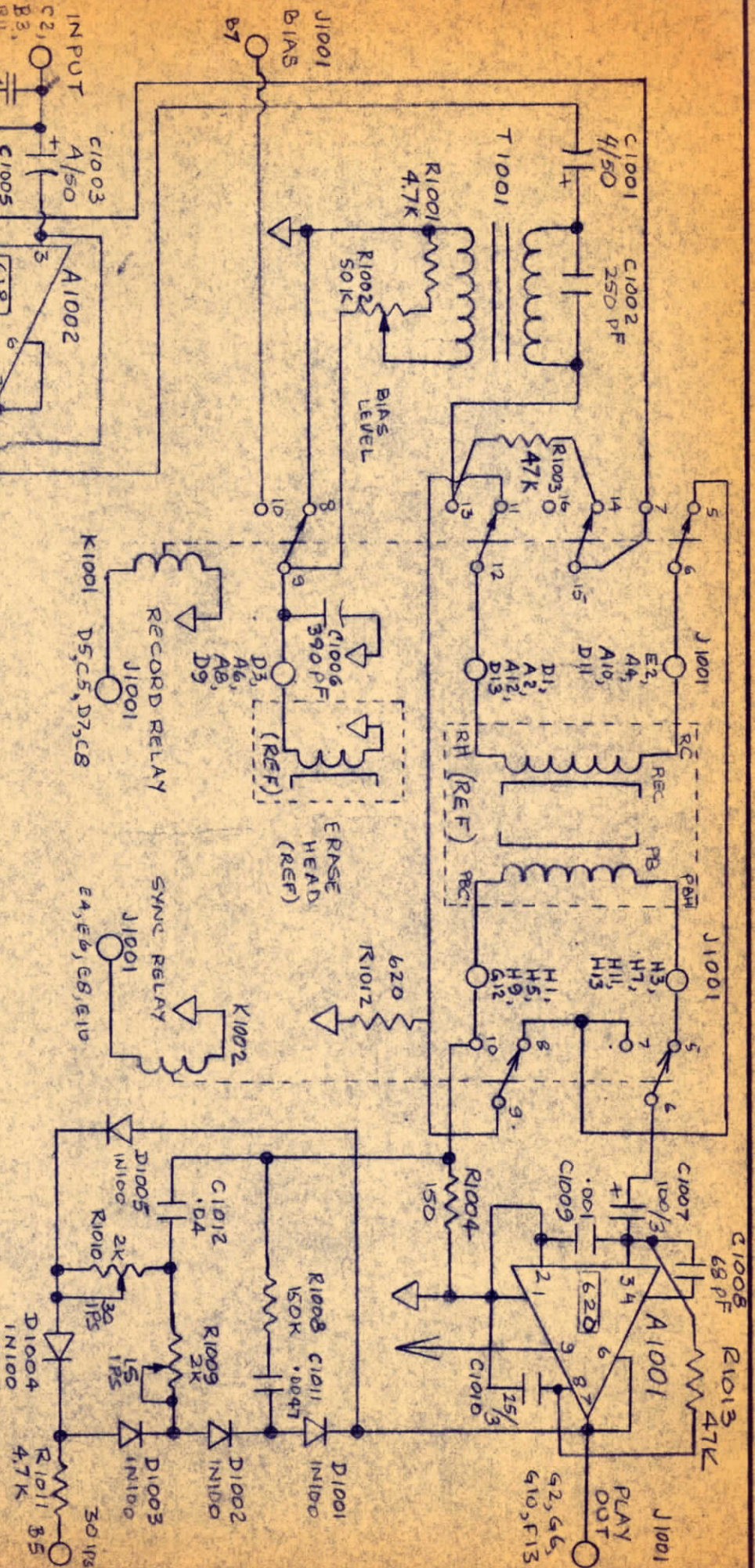
[Signature]

DRAWN BY: lnd-

REVISED 8/28/80

PRE AMP ELECTRONICS

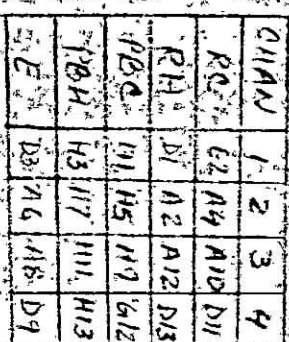
811-D 3100



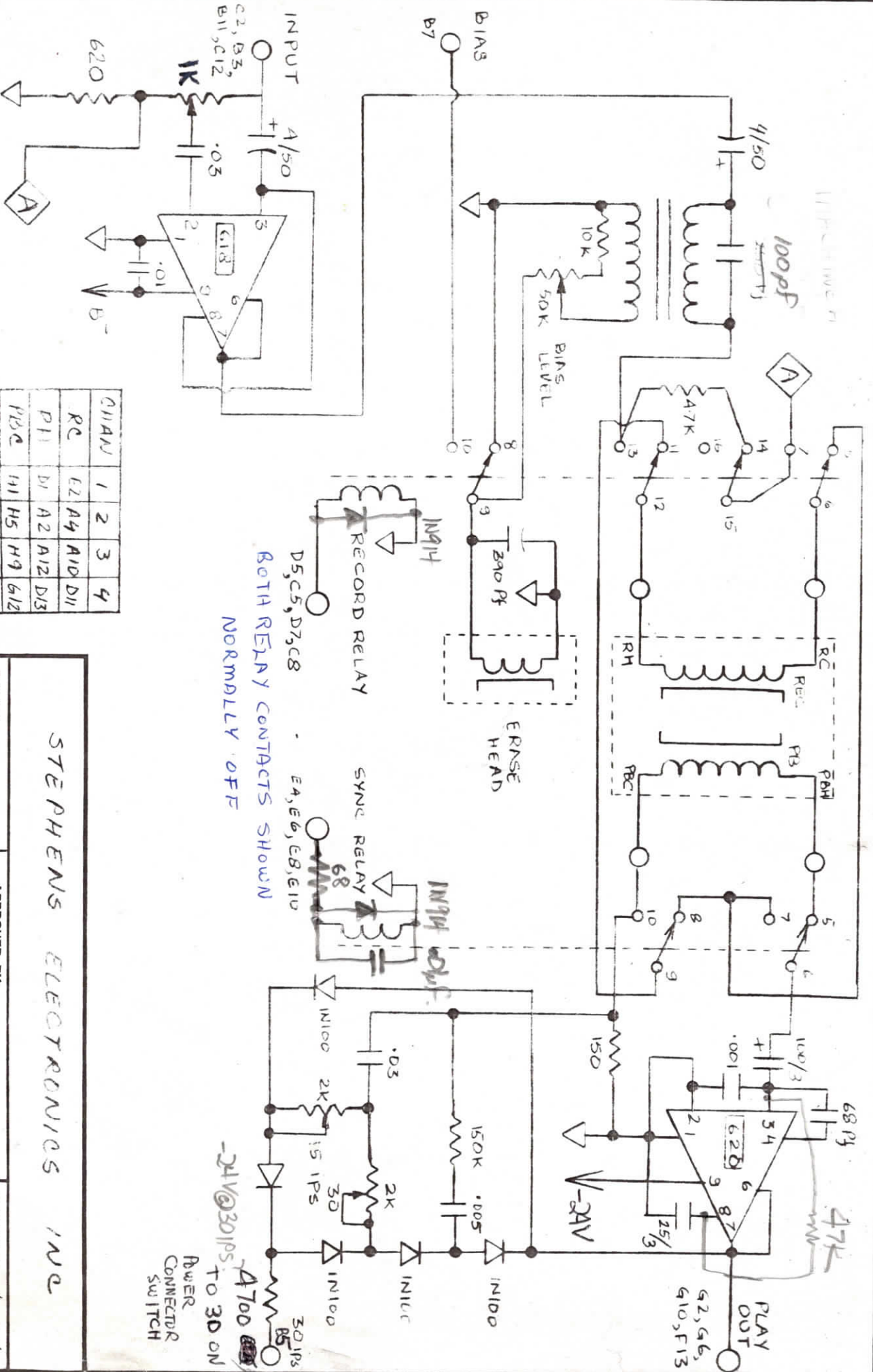
| CHAN | 1 | 2 | 3 | 4 |
|------|----|----|-----|-----|
| RC | E2 | A4 | A10 | D11 |
| RH | D1 | A2 | A12 | D3 |
| PBC | H1 | H5 | H9 | 612 |
| PBH | H3 | H7 | H11 | H13 |
| E | D5 | A6 | A8 | D9 |

AMPLIFIER CANN.
PIN NUMBERS
CHECKING SIGNAL
TO HEAD STACK

| | |
|---------------------------|-------------------------|
| STEPHENS ELECTRONICS INC. | |
| SCALE: — | APPROVED BY: |
| DATE: 6/6/75 | DRAWN BY: laby- |
| REVISED 3/10/79 | |
| PRE AMP ELECTRONICS | |
| 811-D 3100 | DRAWING NUMBER 110912-C |



110912-A



| | | | | |
|-------|----|----|-----|-----|
| CHIAN | 1 | 2 | 3 | 4 |
| RC | E2 | A4 | A10 | D11 |
| P11 | D1 | A2 | A12 | D3 |
| P30 | H1 | H5 | H9 | G12 |
| P24 | H3 | H7 | H11 | H13 |
| E | D3 | A6 | A8 | D9 |

APPROPRIATE COMM.
AND MEMBERS
CALLY/N4, SIGNIN
TO MEMO STACK

STEPHENS ELECTRONICS INC

SCALE:

APPROVED BY:

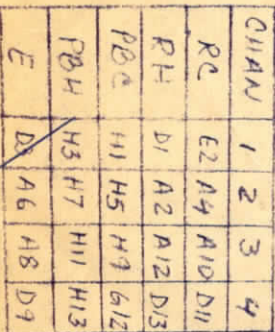
DATE: 6/6/75

REVISED

PRE AMP ELECTRONICS

811-D 3100

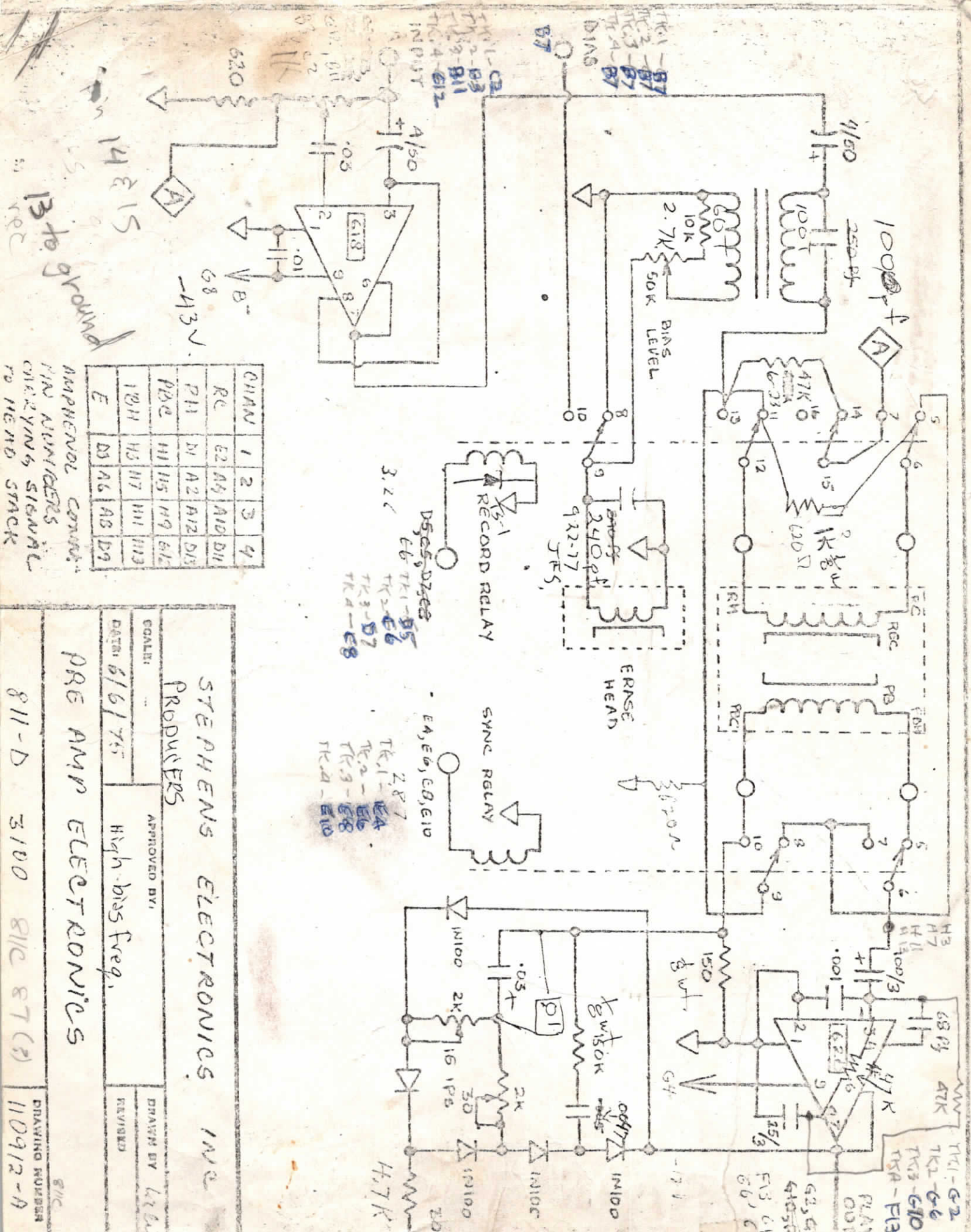
DRAWING NUMBER
110912-A



PRE AMP ELECTRONICS

DRAWING NUMBER

REVISED 3/3/79



| CHAN | 1 | 2 | 3 | 4 |
|------|----|----|-----|-----|
| RE | E2 | A4 | A10 | D11 |
| PH | D1 | A2 | A12 | D13 |
| PDE | H1 | H5 | H9 | G12 |
| 18H | H3 | H7 | H11 | H13 |
| E | D3 | A6 | A8 | D9 |

MAPPHENOL CONTAINING
PVA NUMBERS
CHRYNOL SIGNAL
TO HEAD STACK

| | | | |
|--------------------------|-----------------|----------------|--|
| STEPHENS ELECTRONICS INC | | DRAWING NUMBER | |
| PRODUCERS | | 110912-A | |
| SCALE: | APPROVED BY: | REVIEWED | |
| DATE: 6/6/75 | High bias freq. | | |
| PRE AMP ELECTRONICS | | | |
| 811-D 3100 811C 87 (3) | | 811C | |

| REVISIONS | | | |
|-----------|-------------|------|----|
| LTR | DESCRIPTION | DATE | BY |
| | | | |

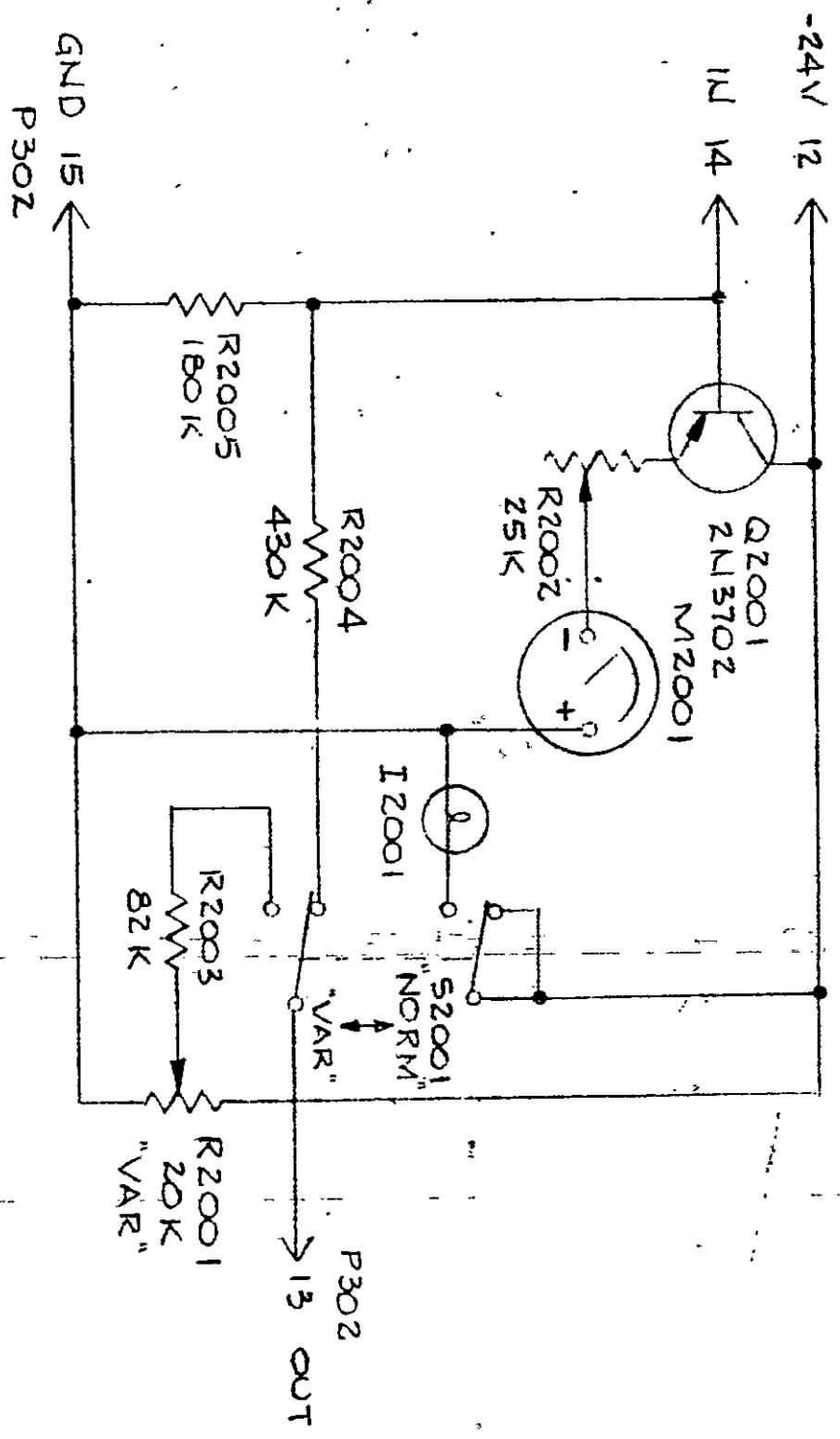


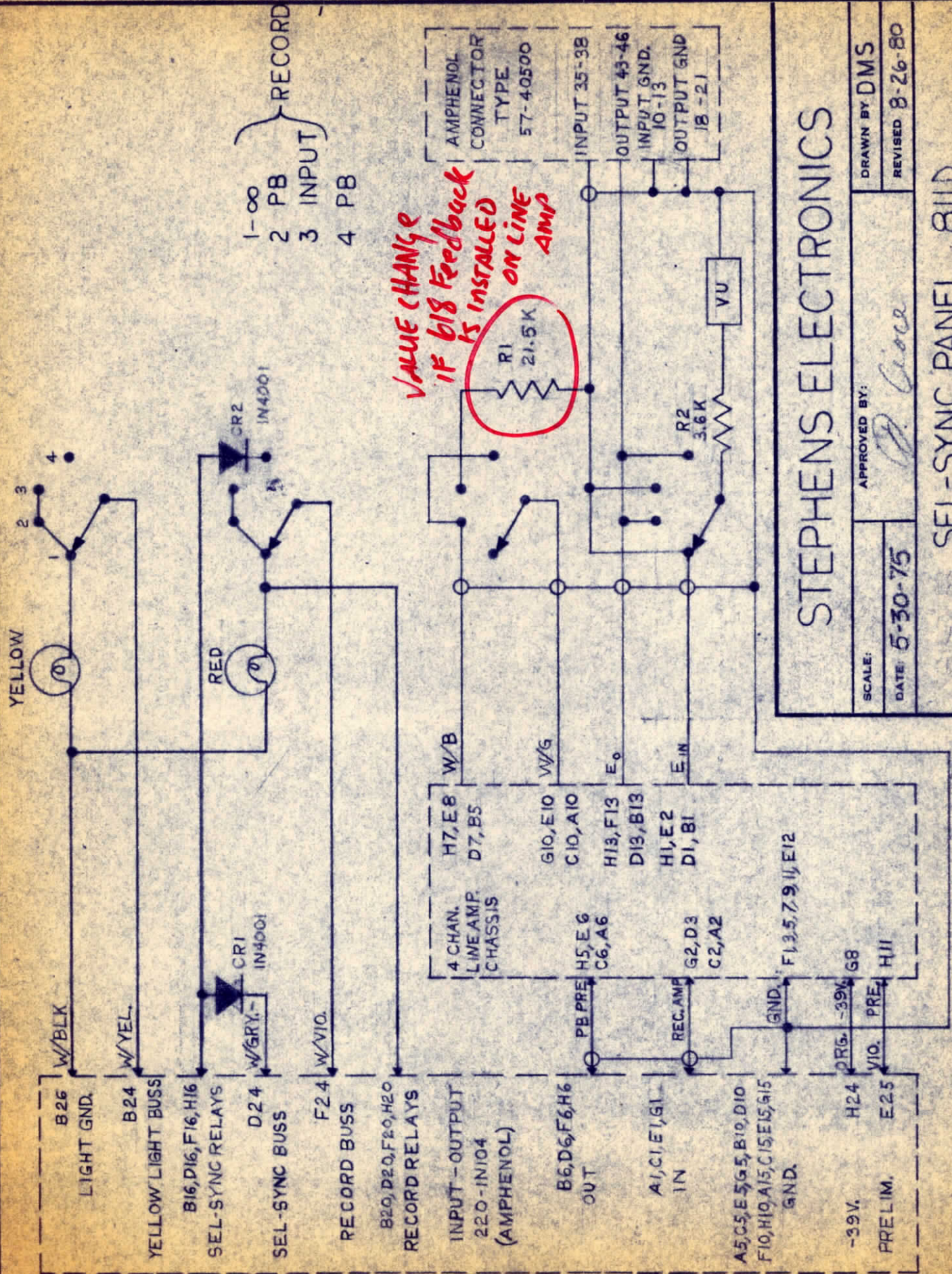
FIGURE 6-17

B
C
E
2N3702
BOTTOM VIEW

STEPHENS ELECTRONICS, INC.

| | | |
|-----------------|--------------|-----------------|
| SCALE: ~ | APPROVED BY: | DRAWN BY: GEFER |
| DATE: 24 SEP 79 | | REVISED |
| VSO MODULE | | |

| | | |
|-------------|-------------|------------------------|
| MODEL 821-B | FIGURE 6-17 | DRAWING NUMBER SC-2001 |
|-------------|-------------|------------------------|



STEPHENS ELECTRONICS

DRAWN BY DMS

REVISED 8-26-80

APPROVED BY:

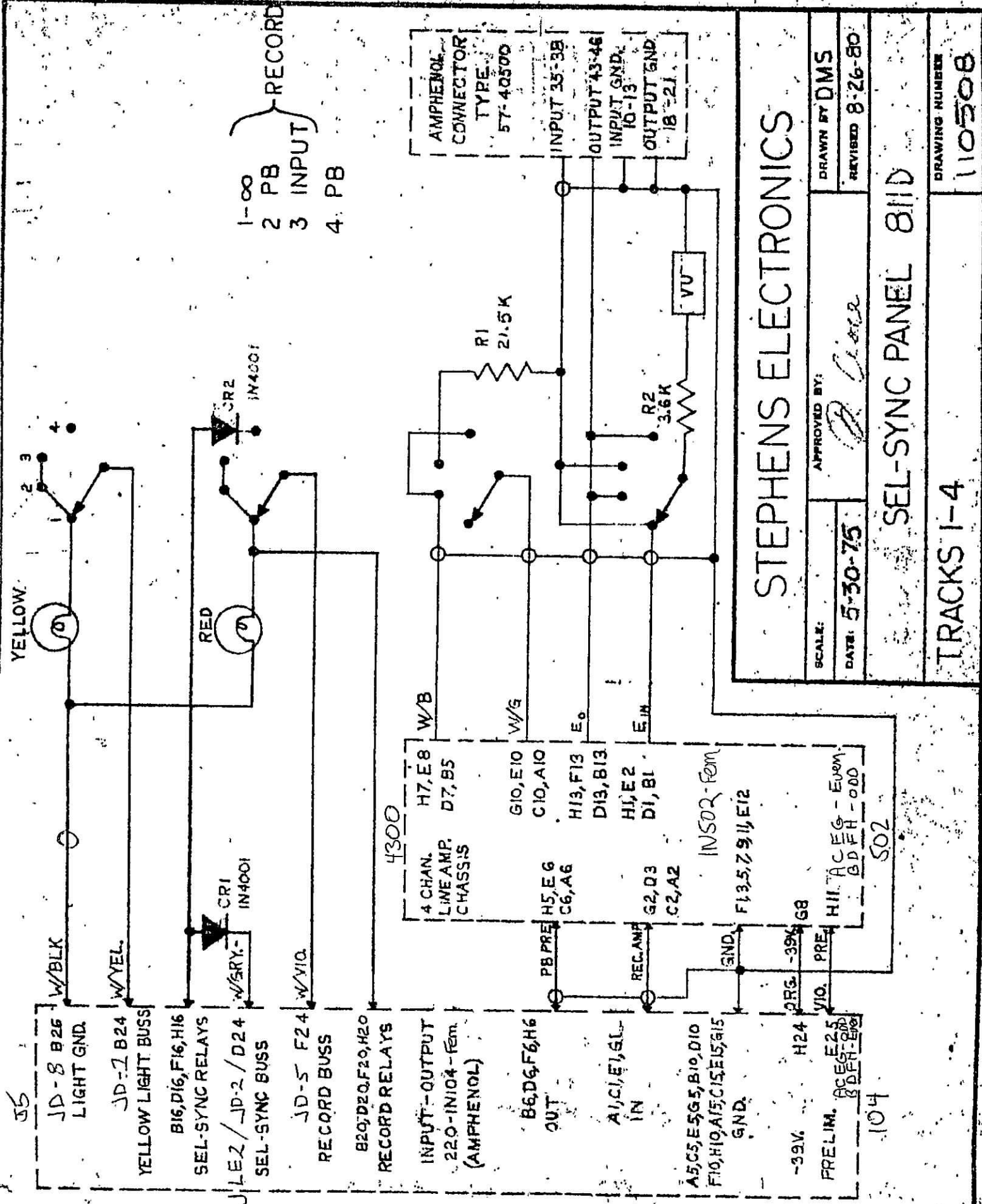
DATE 5-30-75

SEL-SYNC PANEL 811D

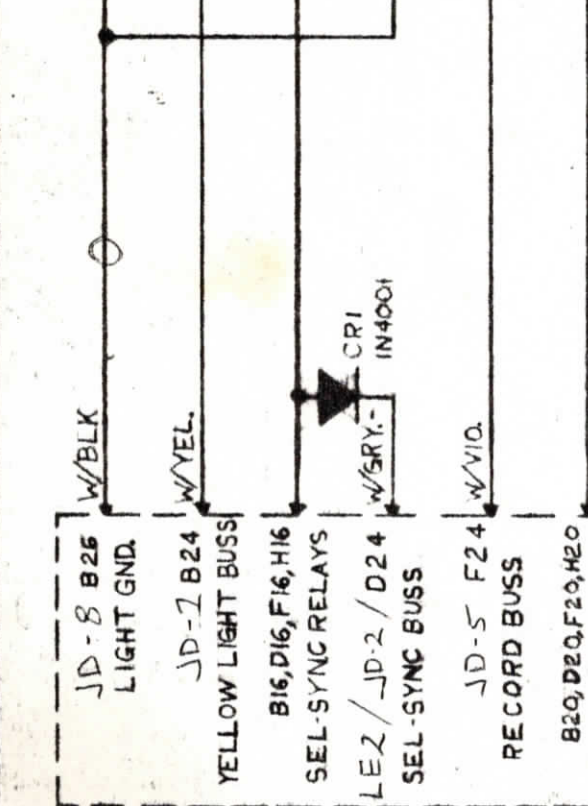
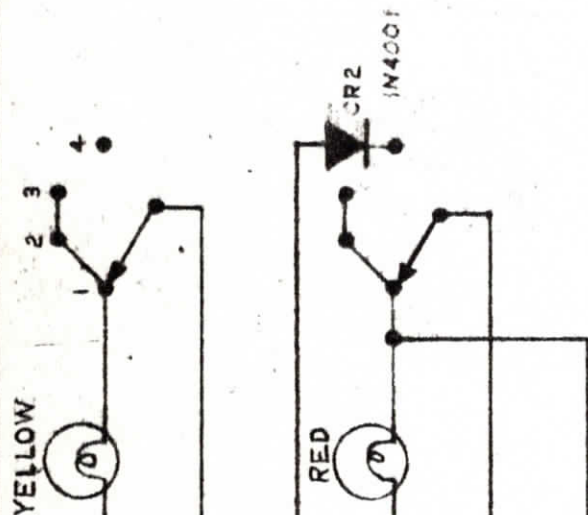
DRAWING NUMBER

110508

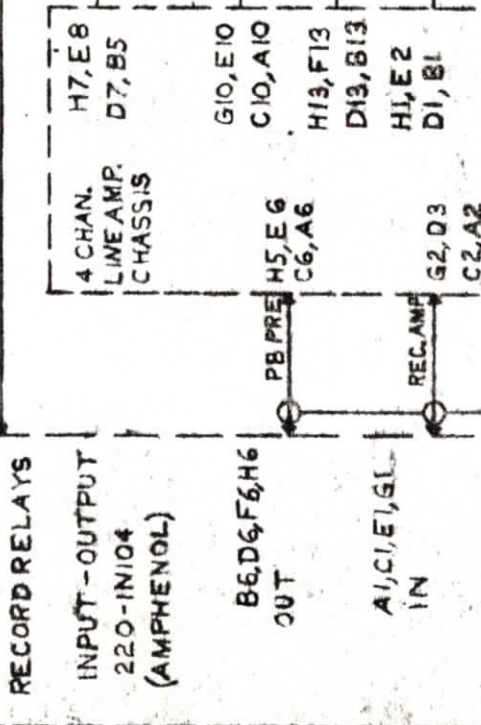
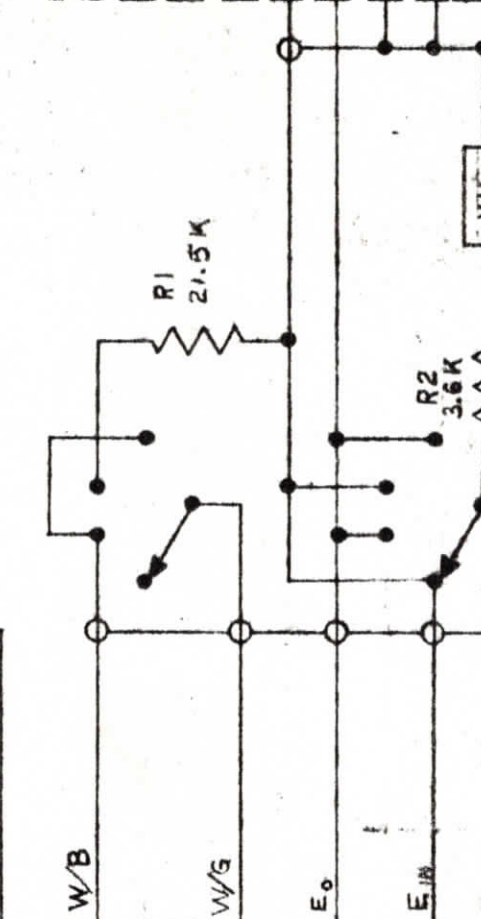
TRACKS 1-4



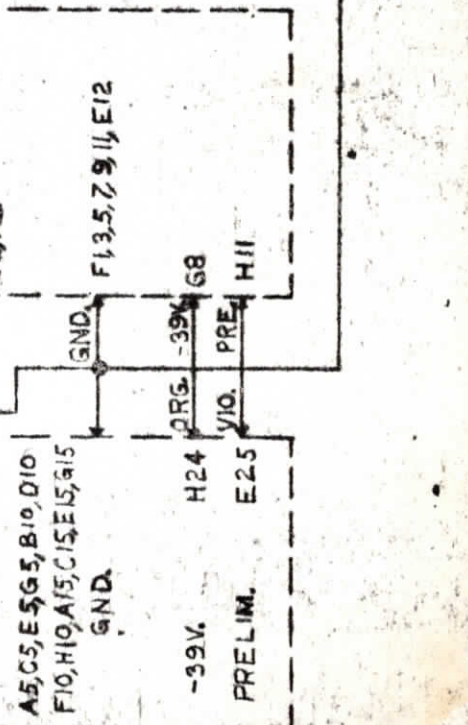
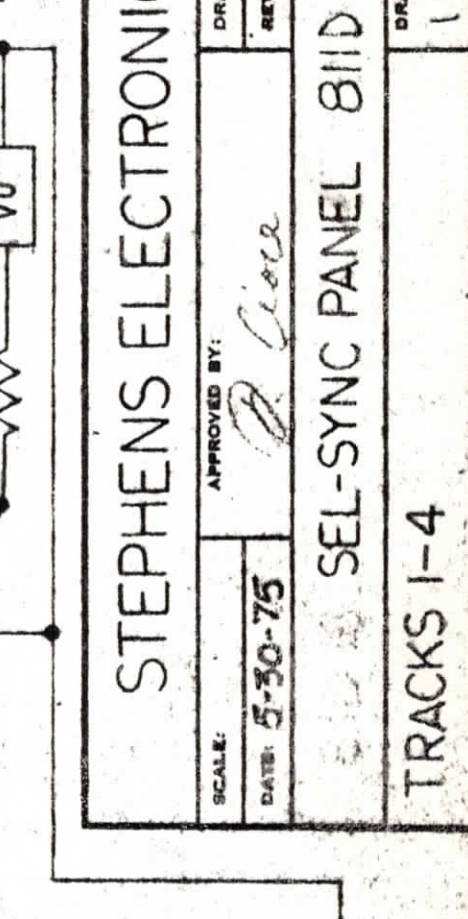
1-∞ } RECORD
2 PB }
3 INPUT }
4 PB }



AMPHENOL
CONNECTOR
TYPE
57-40500



INPUT 35-38
OUTPUT 43-46
INPUT GND
10-13
OUTPUT GND
18-21



STEPHENS ELECTRONICS

SCALE:

DATE: 5-30-75

APPROVED BY:

DRAWN BY DMS

REVISED 8-26-80

SEL-SYNC PANEL 811D

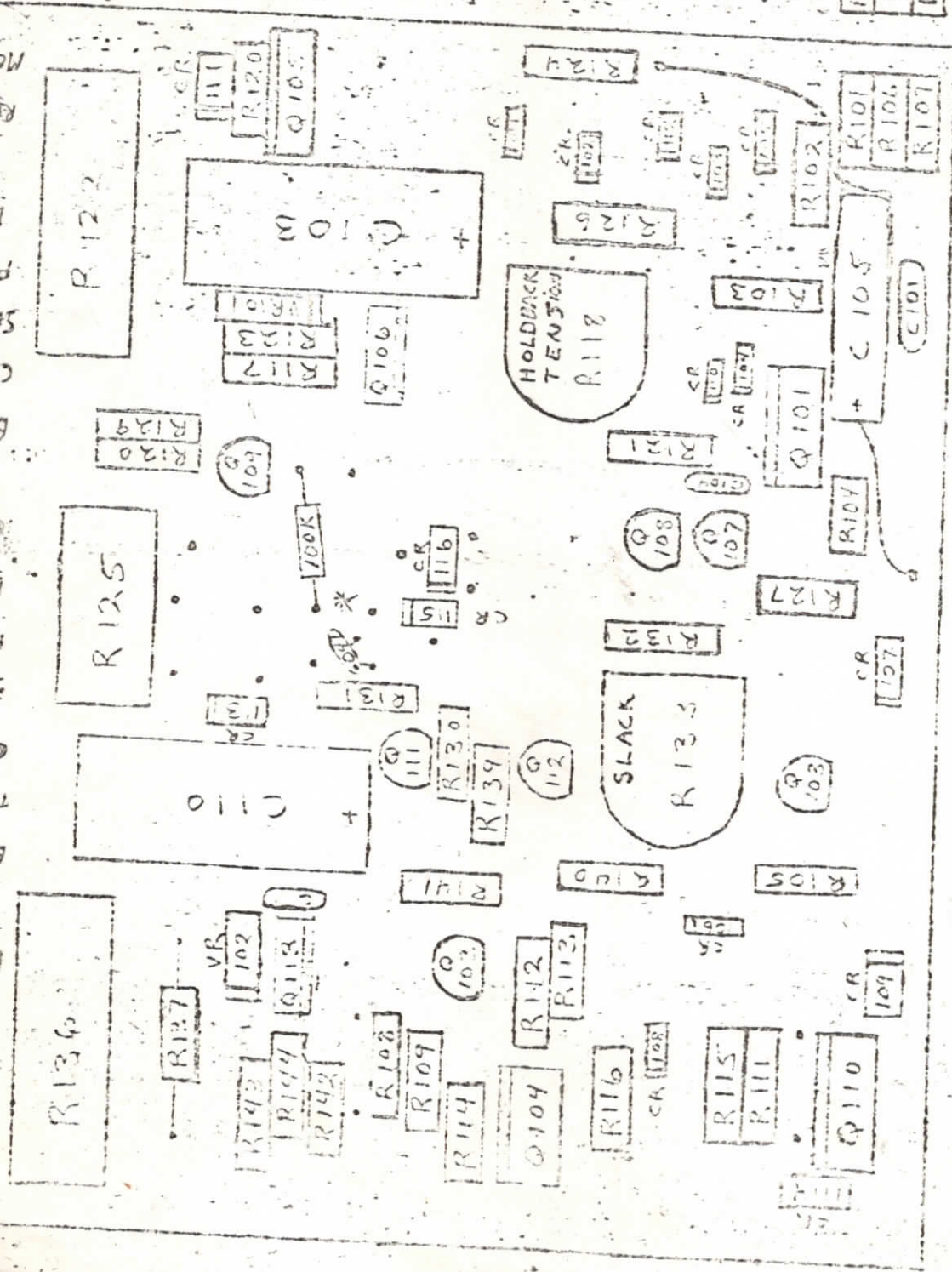
TRACKS 1-4

DRAWING NUMBER

110508

Master Copies

Z GND
 Y M.C.
 X PLAY
 M PRE
 N PR CLAMP
 GND
 BASE Q22
 T TAP LFT
 S COL Q22
 R SACK
 D ANT H
 M EMTG
 W GND
 L B-
 K BRSEA
 J COL Q16
 H SERVON
 F FST FWD
 D LOAD
 C B-
 B REWIND
 A MOTION



PART MODIFICATION PARTS IN RED,
 WE COULD BE USED ON NEW MACHINES
 CHECK SECOND PAGE FOR PRESENT
 FORMAT

STEPHENS ELECTRONICS, INC.

SCALE: 2:1
 DATE: 7/10/77
 44777
 APPROVED BY: Anti-Low level
 DRAWN BY: R
 REVISED: R

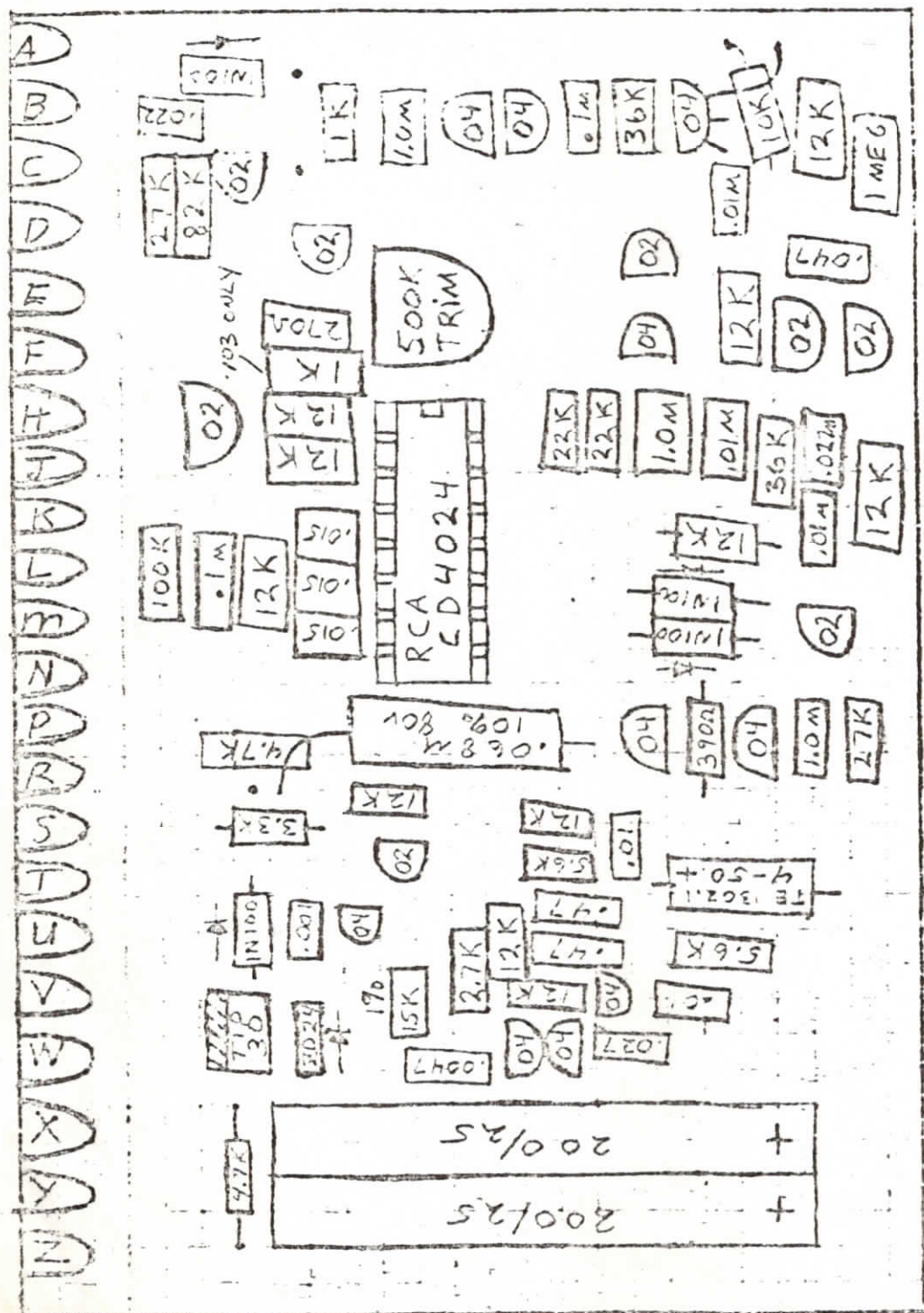
811D-103

CONVERTER
310164

also on 821 24T

2/3/76

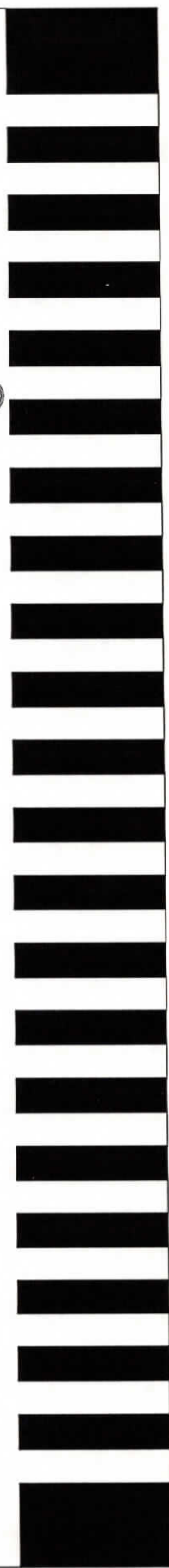
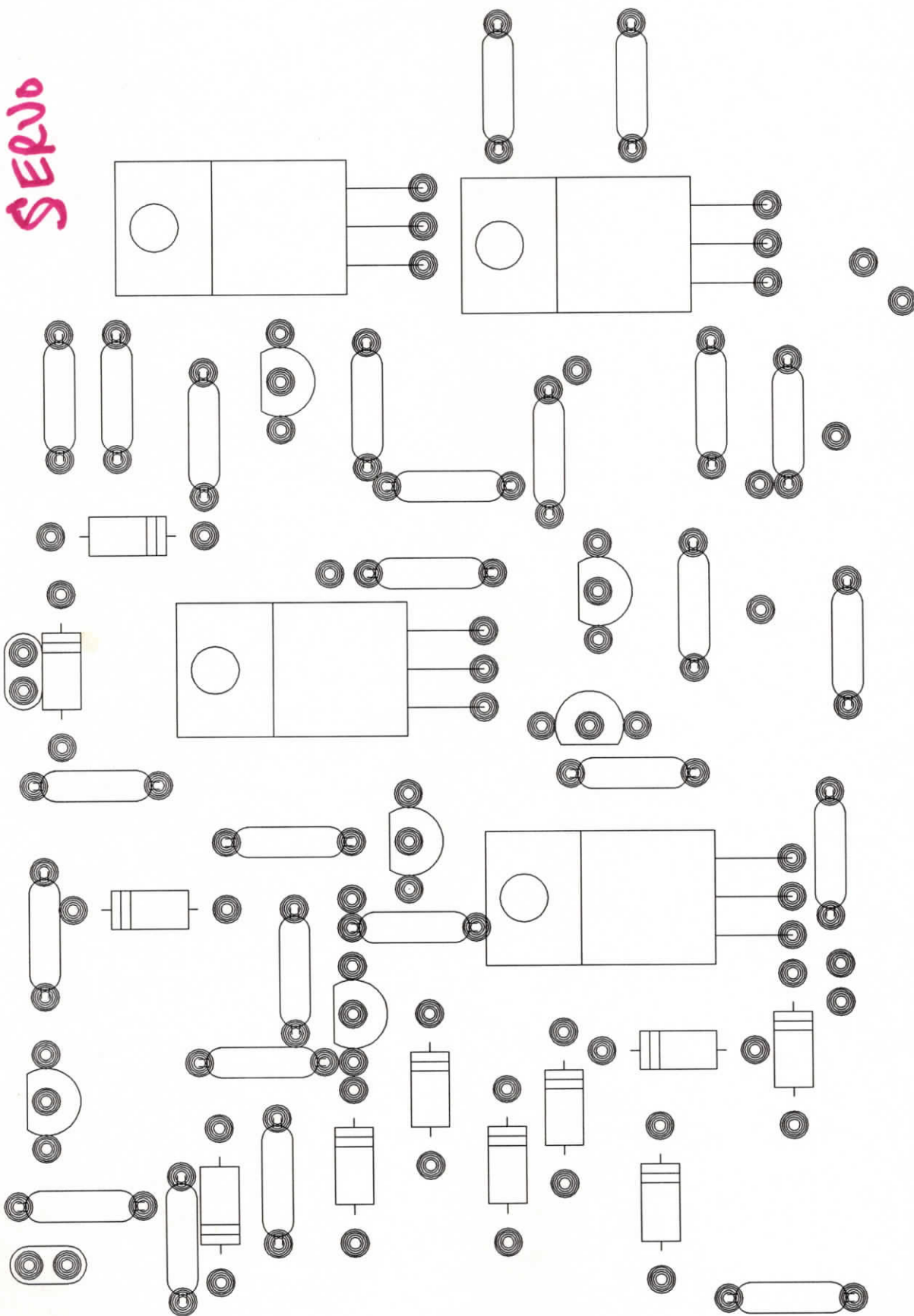
Quaplar



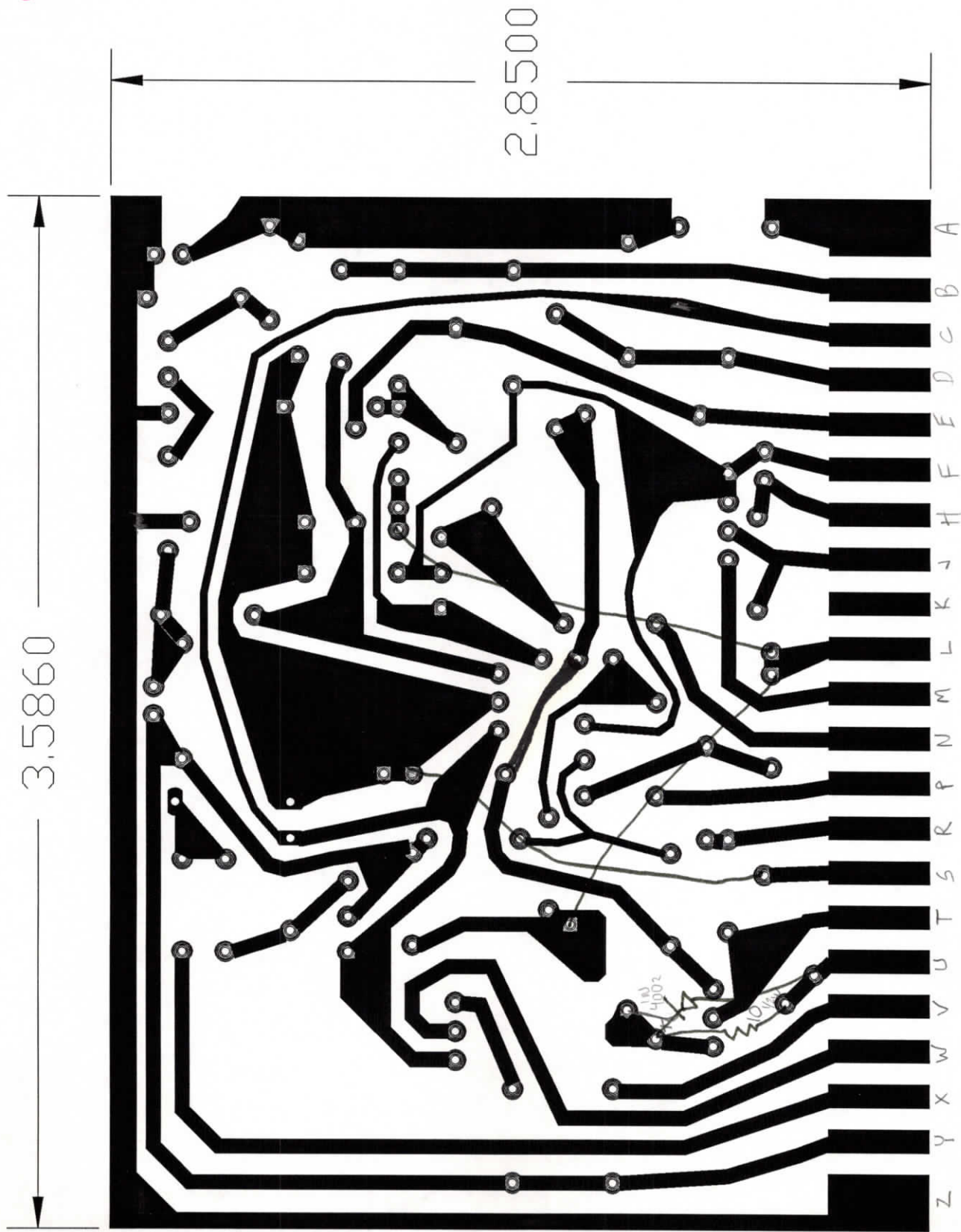
103-: ADD 1K

104-201K

SERVO

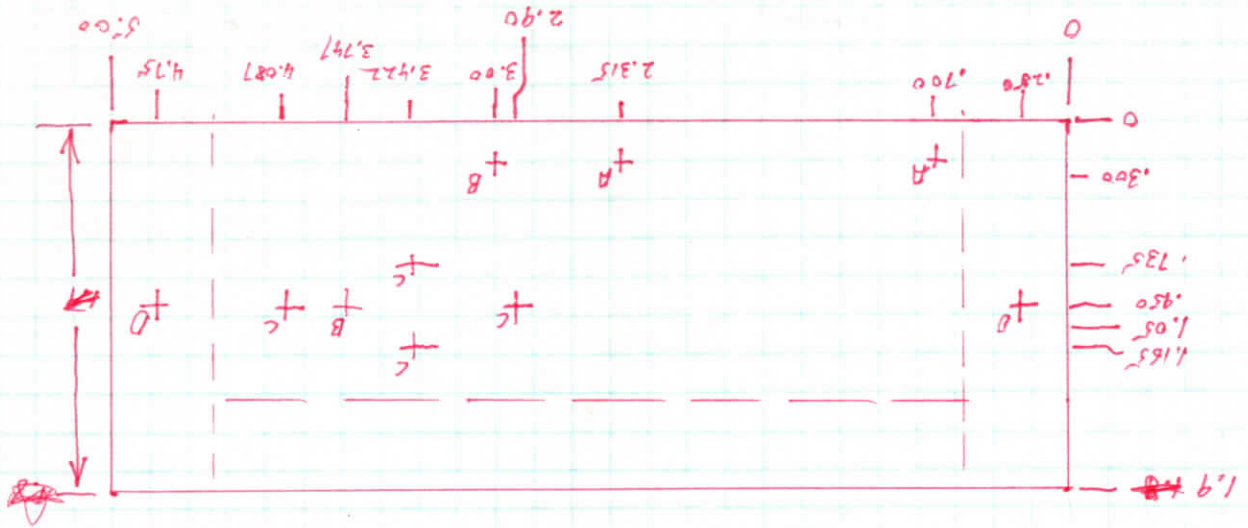


SERVO



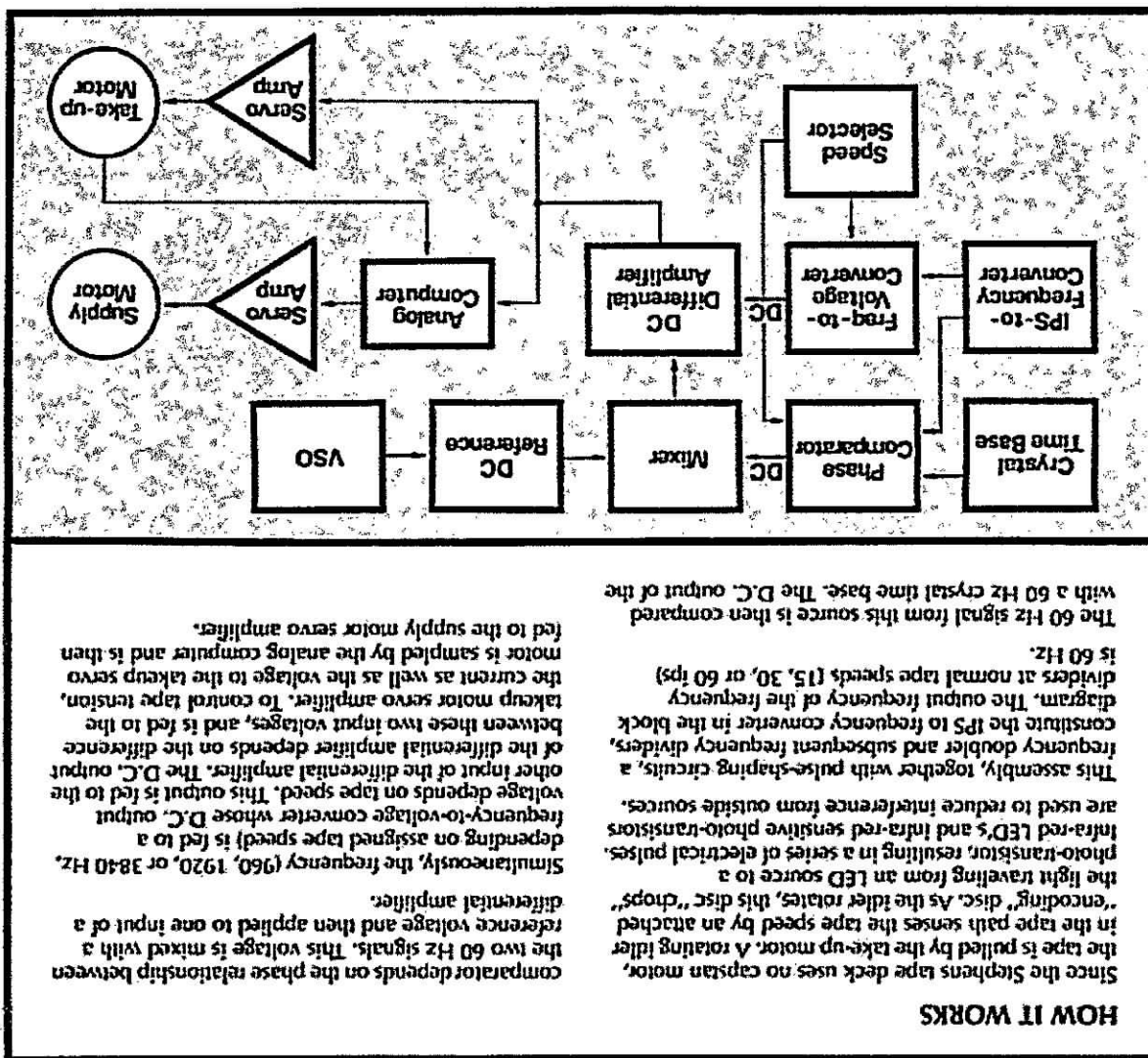
SERVO PCB
SOLDER SIDE

$A = 6.32$
 $B = 4.40$
 $C = \#2 \text{ DALL}$
 $D = \#28 \text{ DALL}$



SERVO POWER AMP CHASSIS

2-X-85



TO:
FROM:
SUBJECT:

Part Sources

PARTS AND

31013 CHAS

DATE:

7/8/24

CARD # 310163

| ITEM | TOTAL # PER CARD | 15.2 1/4" |
|---------------------|------------------|-----------|
| 47K | 2 | |
| 100K | 2 | |
| 1K | 8 | |
| 1.5K | 1 | |
| 1.8K | 4 | |
| 2K | 1 | |
| 2.7K | 2 | |
| 4.7K | 2 | |
| 7.5K | 1 | |
| 12K | 1 | |
| 15K | 1 | |
| 22K | 2 | |
| 27K | 3 | |
| 36K | 1 | |
| 56K | 1 | |
| 82K | 1 | |
| 150K | 1 | |
| 270K | 1 | |
| 4.7M | 1 | |
| FRW-RCR3264R715 | | |
| 15.2 370 | 2 | |
| 15.2 INT | 1 | |
| TSI | 7 | |
| IN100 | 10 | |
| IN4755A | 2 | |
| 2N3702 | 5 | |
| 2N3704 | 4 | |
| TIP 121 | 2 | |
| TIP 29 | 2 | |
| 50K | 1 | |
| 3359 P | 1 | |
| 3359 P | 1 | |
| 200K | 1 | |
| 18121-050-651-273M | | |
| 18131-100-W580-104K | | |
| 18121-100-W580-103K | | |

| | | |
|---------------------|----|--|
| 47K | 2 | |
| 100K | 2 | |
| 1K | 8 | |
| 1.5K | 1 | |
| 1.8K | 4 | |
| 2K | 1 | |
| 2.7K | 2 | |
| 4.7K | 2 | |
| 7.5K | 1 | |
| 12K | 1 | |
| 15K | 1 | |
| 22K | 2 | |
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| 36K | 1 | |
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| 1.8K | 4 | |
| 2K | 1 | |
| 2.7K | 2 | |
| 4.7K | 2 | |
| 7.5K | 1 | |
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| 15K | 1 | |
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| 1.8K | 4 | |
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| 4.7K | 2 | |
| 7.5K | 1 | |
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| 15K | 1 | |
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| 2.7K | 2 | |
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| 7.5K | 1 | |
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| 18121-100-W580-103K | | |

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| 100K | 2 | |
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| 1.5K | 1 | |
| 1.8K | 4 | |
| 2K | 1 | |
| 2.7K | 2 | |
| 4.7K | 2 | |
| 7.5K | 1 | |
| 12K | 1 | |
| 15K | 1 | |
| 22K | 2 | |
| 27K | 3 | |
| 36K | 1 | |
| 56K | 1 | |
| 82K | 1 | |
| 150K | 1 | |
| 270K | 1 | |
| 4.7M | 1 | |
| FRW-RCR3264R715 | | |
| 15.2 370 | 2 | |
| 15.2 INT | 1 | |
| TSI | 7 | |
| IN100 | 10 | |
| IN4755A | 2 | |
| 2N3702 | 5 | |
| 2N3704 | 4 | |
| TIP 121 | 2 | |
| TIP 29 | 2 | |
| 50K | 1 | |
| 3359 P | 1 | |
| 3359 P | 1 | |
| 200K | 1 | |
| 18121-050-651-273M | | |
| 18131-100-W580-104K | | |
| 18121-100-W580-103K | | |

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|---------------------|----|--|
| 47K | 2 | |
| 100K | 2 | |
| 1K | 8 | |
| 1.5K | 1 | |
| 1.8K | 4 | |
| 2K | 1 | |
| 2.7K | 2 | |
| 4.7K | 2 | |
| 7.5K | 1 | |
| 12K | 1 | |
| 15K | 1 | |
| 22K | 2 | |
| 27K | 3 | |
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| 3359 P | 1 | |
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| 47K | 2 | |
| 100K | 2 | |
| 1K | 8 | |
| 1.5K | 1 | |
| 1.8K | 4 | |
| 2K | 1 | |
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| 4.7K | 2 | |
| 7.5K | 1 | |
| 12K | 1 | |
| 15K | 1 | |
| 22K | 2 | |
| 27K | 3 | |
| 36K | 1 | |
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| 150K | 1 | |
| 270K | 1 | |
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| | | |
|------|---|--|
| 47K | 2 | |
| 100K | 2 | |
| 1K | 8 | |
| 1.5K | 1 | |
| 1.8K | | |



TO:
FROM:
SUBJECT:

DATE: 7/8/74

310163 COMT

TOTAL PER CARD

2 8131-050-651-105M

1 8131-050-651-474M

1 8121-100-651-473M

2 TE 1306

150/25 1 TE 1212

CARD # 310164

5 PRNGUE (16, 26, 18, 14, 7)

ORDERING INFO

ERIE (25, 18, 16)

1/4 WT. 109%

(16, 15, 7)

OR IF CANT FIND

OHMITE

1/4 WT. 109% (20, 25)

RESISTORS

CAPACITORS

POTS

RN55C (29)

BARRES (12)

ERIE (25, 18, 16)

BARRES

15K 1% RN55C 1502F

40.2K 1% RN55C 4022

10K

100K 11

1M 1

10K 11

1M 1

100K 11

47K 11

36K 12

22K 11

18K 11

12K 11

5.6K 12

4.7K 13

3.3K 12

2.7K 13

2K 11

1.8K 11

1K 12

390 11

270 11

150/25 1 TE 1212

35/50 2 TE 1306

1 8121-100-651-473M

1 8131-050-651-474M

2 8131-050-651-105M

1 8131-050-651-474M

1 8121-100-651-473M

1 8121-100-651-473M

1 8121-100-651-473M

1 8121-100-651-473M

1 8121-100-651-473M

1 8121-100-651-473M



TO:
FROM:
SUBJECT:

DATE: 7/8/74

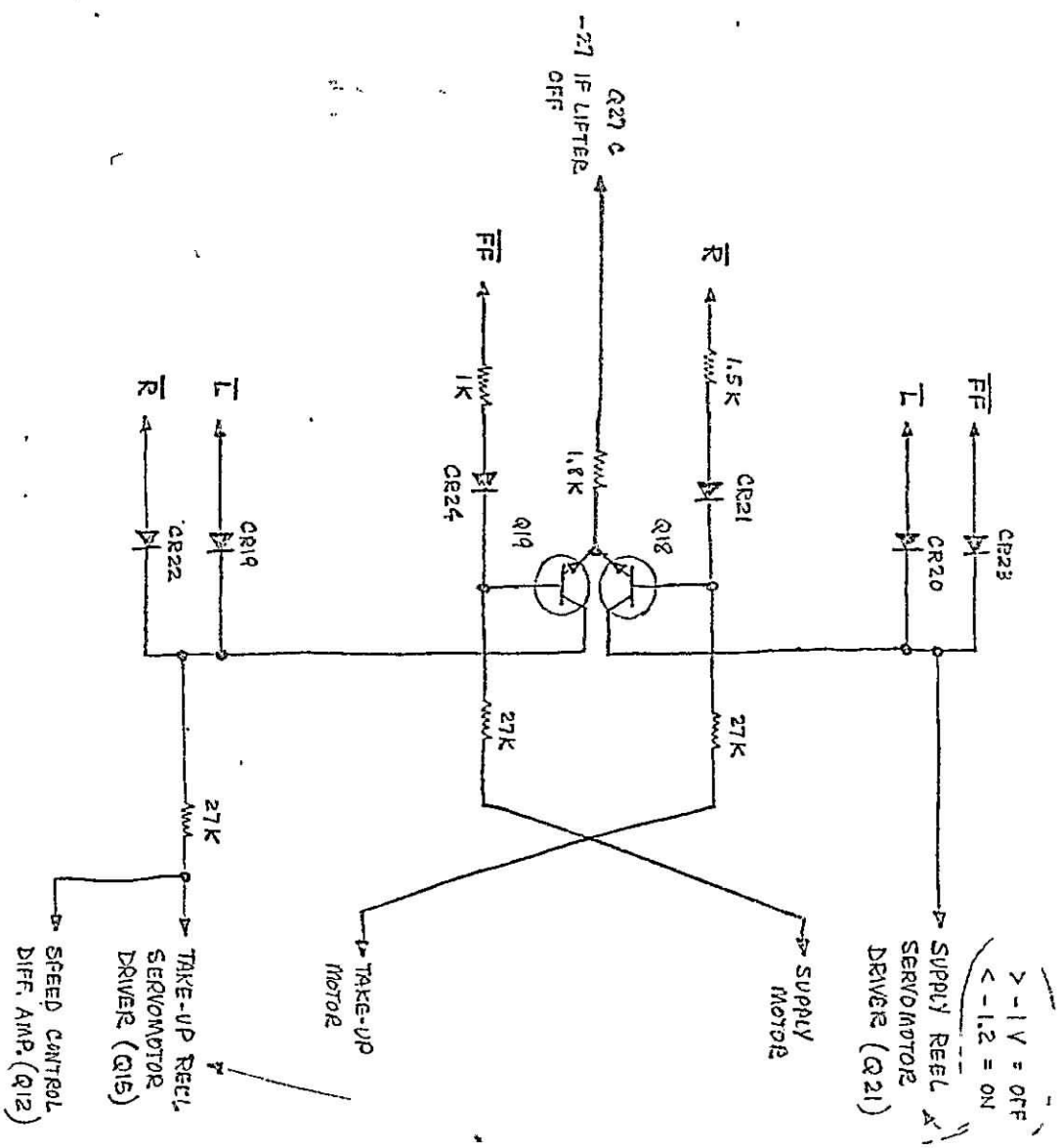
310164 CONT

| ITEM | TOTAL # / CARD | ORDERING INFO |
|---------|----------------|-------------------------------------|
| 47/50V | 2 | 8131-050-651-474M |
| 10/50V | 3 | 8131-050-651-105M |
| 068/80V | 1 | 10% |
| 4/50 | 7 | TE 1302.11 |
| 200/25 | 2 | 500D2076025DH7 |
| 1N100A | 4 | |
| 1N4749A | 9 | MOTOROLA 2D (8116, 7) (8 UPRAD) |
| 2N3702 | 9 | TRANSISTORS |
| 2N3704 | 9 | TEXAS INSTR. (25, 20, 18) |
| TIP30 | 1 | |
| 1C | 1 | CD4004 RCA |
| | | IC'S - (13, 18, 16, 1C'S IN VARIOUS |

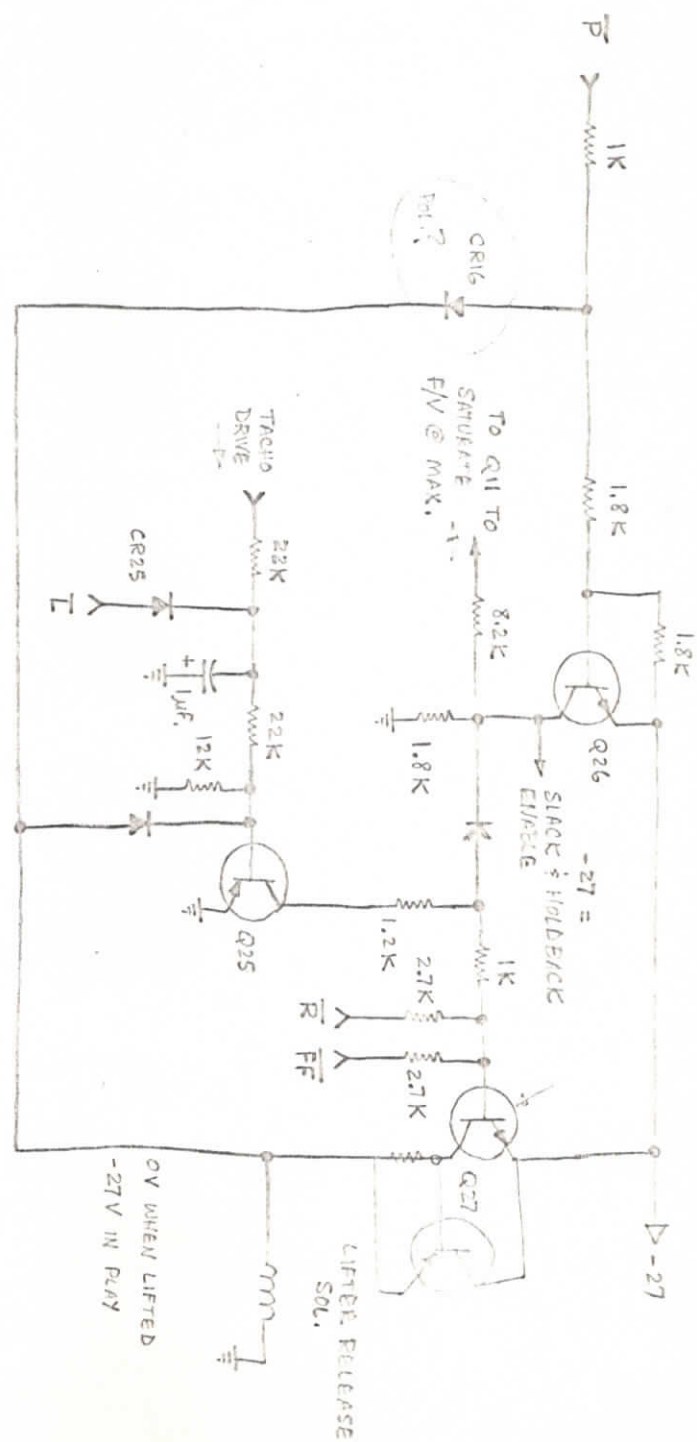
SEMICONDUCTORS

CAPACITORS

SIMPLIFIED SERVO LOGIC CIRCUIT

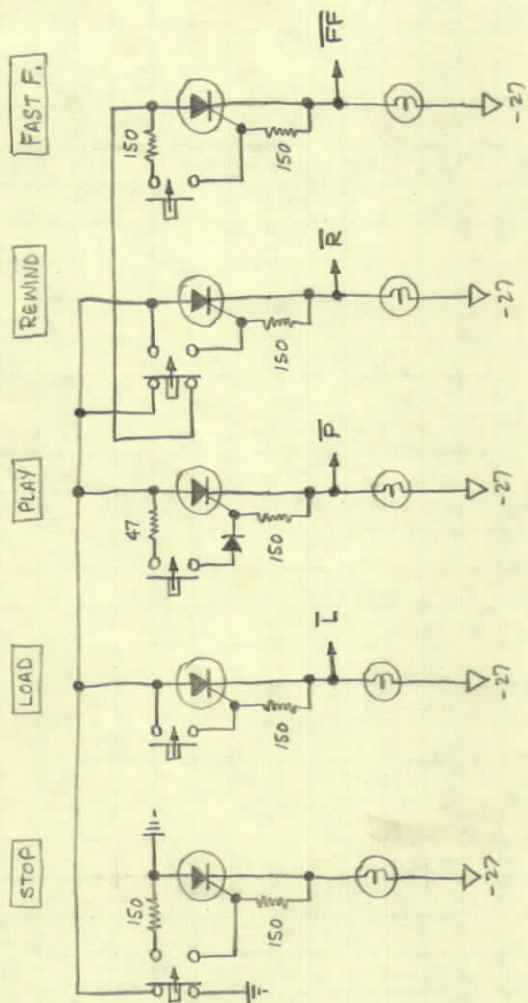


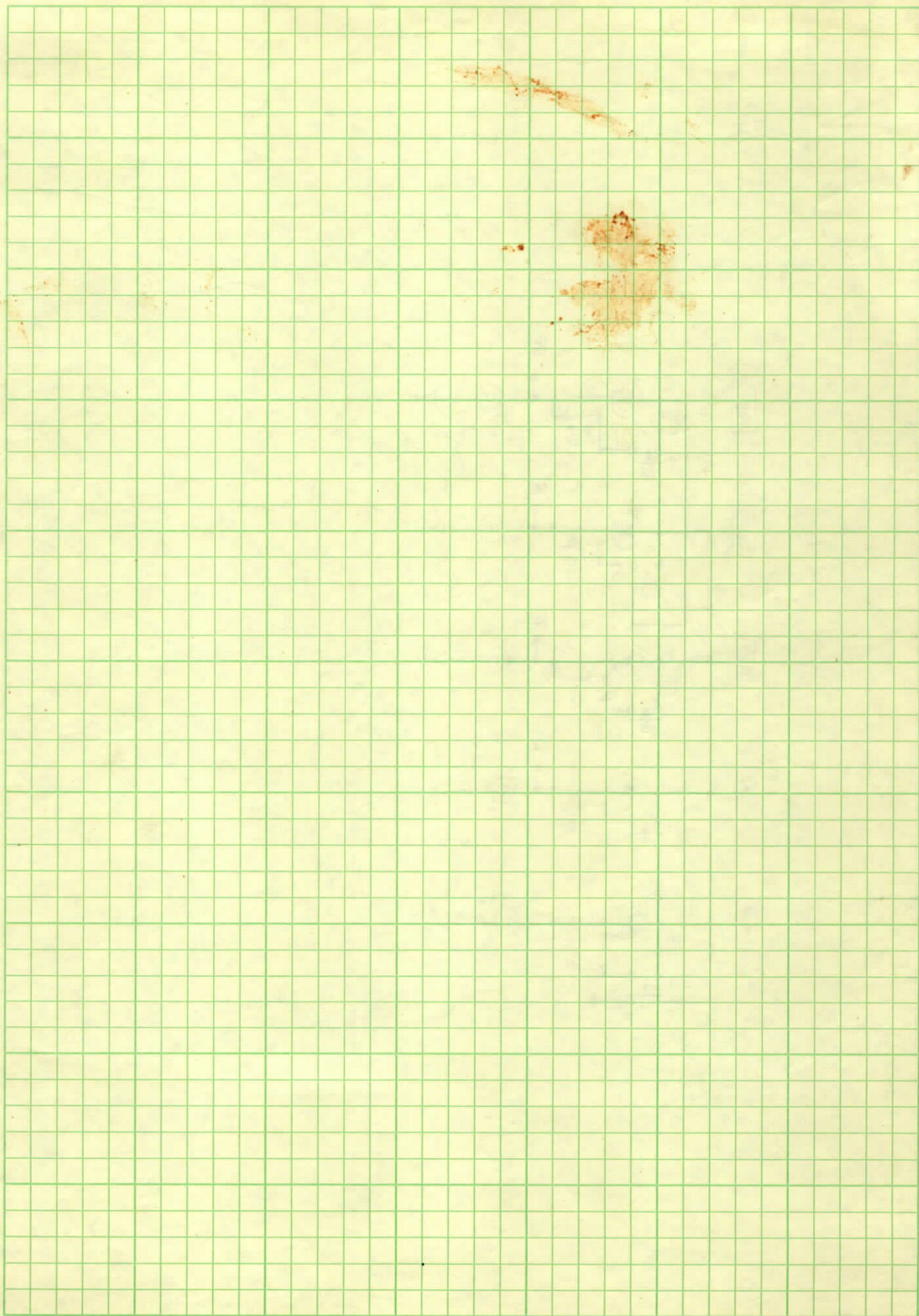
SECRET



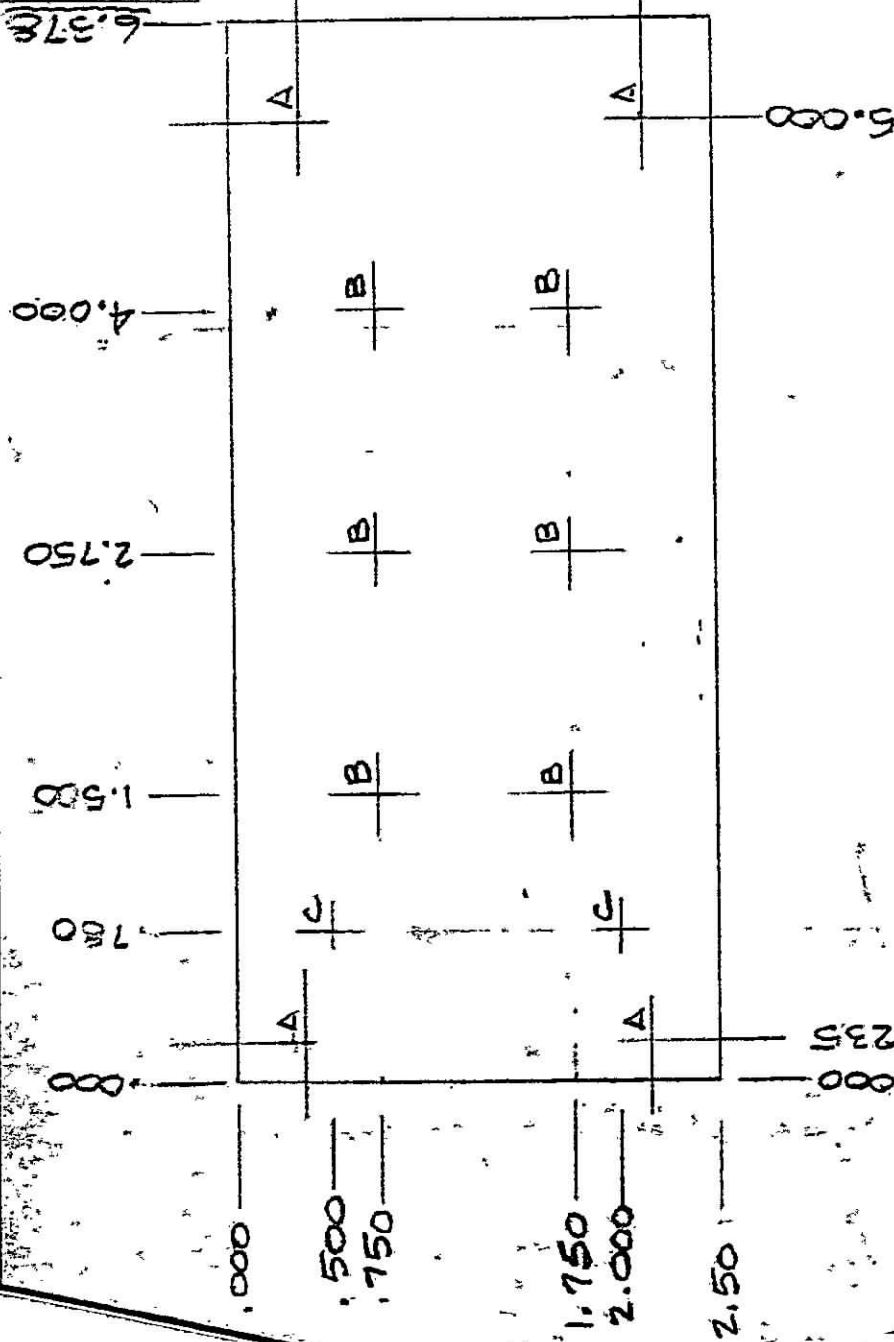
SIMPLIFIED CONTROL SCHEMATIC

* COMMUTATING CAPS NOT SHOWN





| REVISIONS | | |
|-----------|---------------------------------------|----------|
| SYM | DESCRIPTION | DATE |
| A | LENGTH WAS 5.490 DWG. NOT TO SCALE | 4/7/72 |
| B | ADDED C HOLES | 10/16/72 |
| | .000 C MODEL WAS BILD-103 | 6/18/80 |



MAT'L - .090 THK ALUM 6061-T6
 FINISH - ALODINE
 $XX = \pm .010$ $XXX = \pm .005$

STEPHENS ELECTRONICS, INC.

| | | |
|--------------|--------------|-----------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: GEIER |
| DATE: 1/9/72 | | REVISED 7-1-82 |

DECK PANEL - RIGHT LOWER

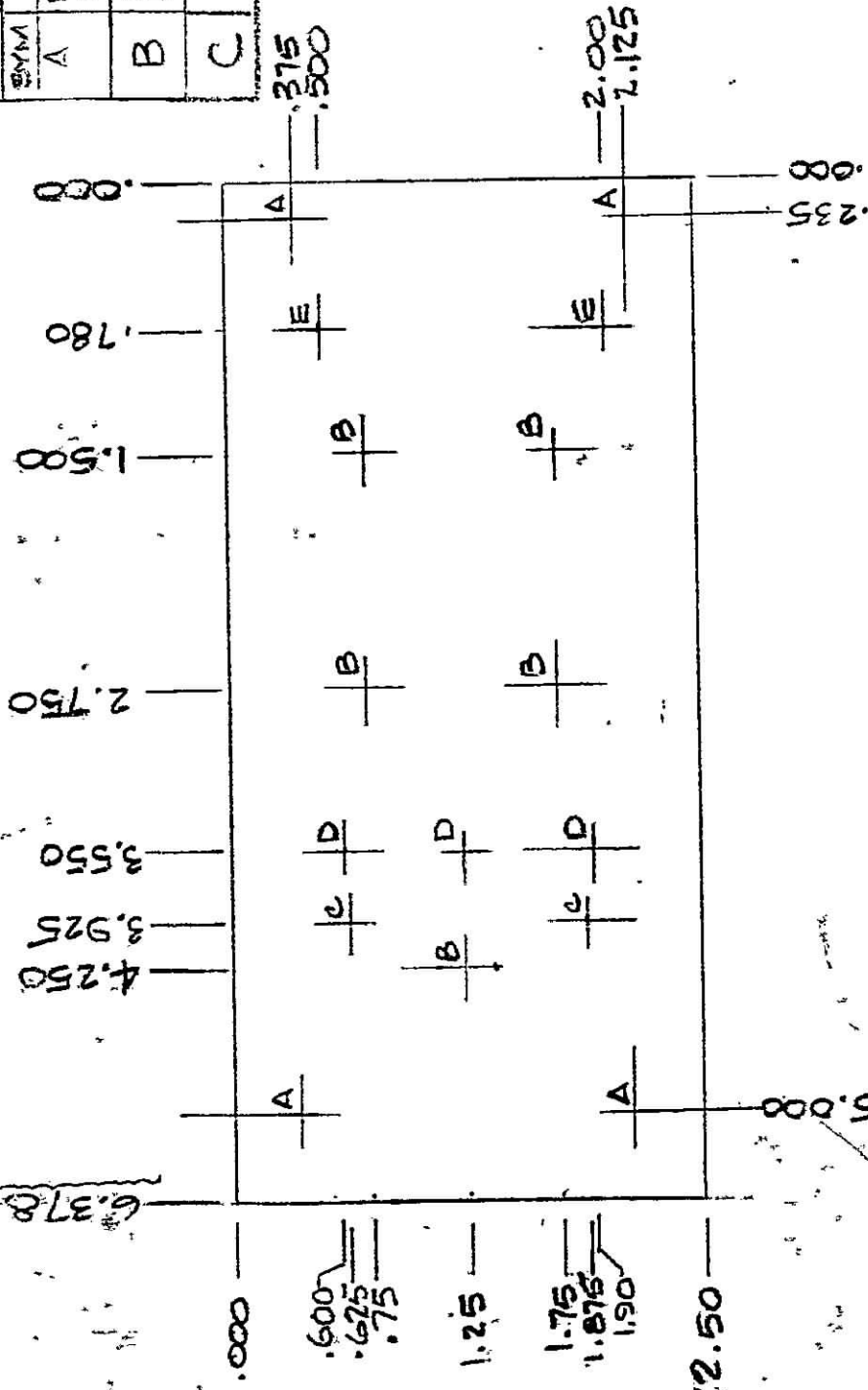
| | |
|------------------|--------------------|
| MODELS 103 & 104 | DRAWING NUMBER REV |
| | 1101080 |

A = DRILL & C'SINK FOR 6-32
 FL. HD. SCREW

* B = .025 DIA.
 C = DRILL & C'SINK FOR B-32
 FL. HD. SCREW (COVERS 1/2" HOLE)

* NOTE: HOLE PATTERN OF
 "B" HOLES MUST MATCH
 WITH PART NO. A10106

| REVISIONS | | |
|-----------|---------------------------------------|---------|
| SYM | DESCRIPTION | DATE |
| A | LENGTH WAS 5.450 DWG. NOT TO SCALE | 4/17/72 |
| B | ADDED C, D, & E HOLES | 1/16/73 |
| C | MODEL WAS 811D-103 | 6/18/80 |



- A: DRILL & C/SINK FOR 6-32 FL. HD. SCREW
- B: .625" DIA.
- C: DRILL & C/SINK FOR 4-40 FL. HD. SCREW
- D: DRILL #27 (.144)
- E: DRILL & C/SINK FOR 8-32 FL. HD. SCREW
(OVER-SIZE HOLE)

MAT'L: .090 THK ALUM 6061-T6
 FINISH: ALODINE
 XX = ±.010 XXX = ±.005

STEPHEN'S ELECTRONICS, INC.

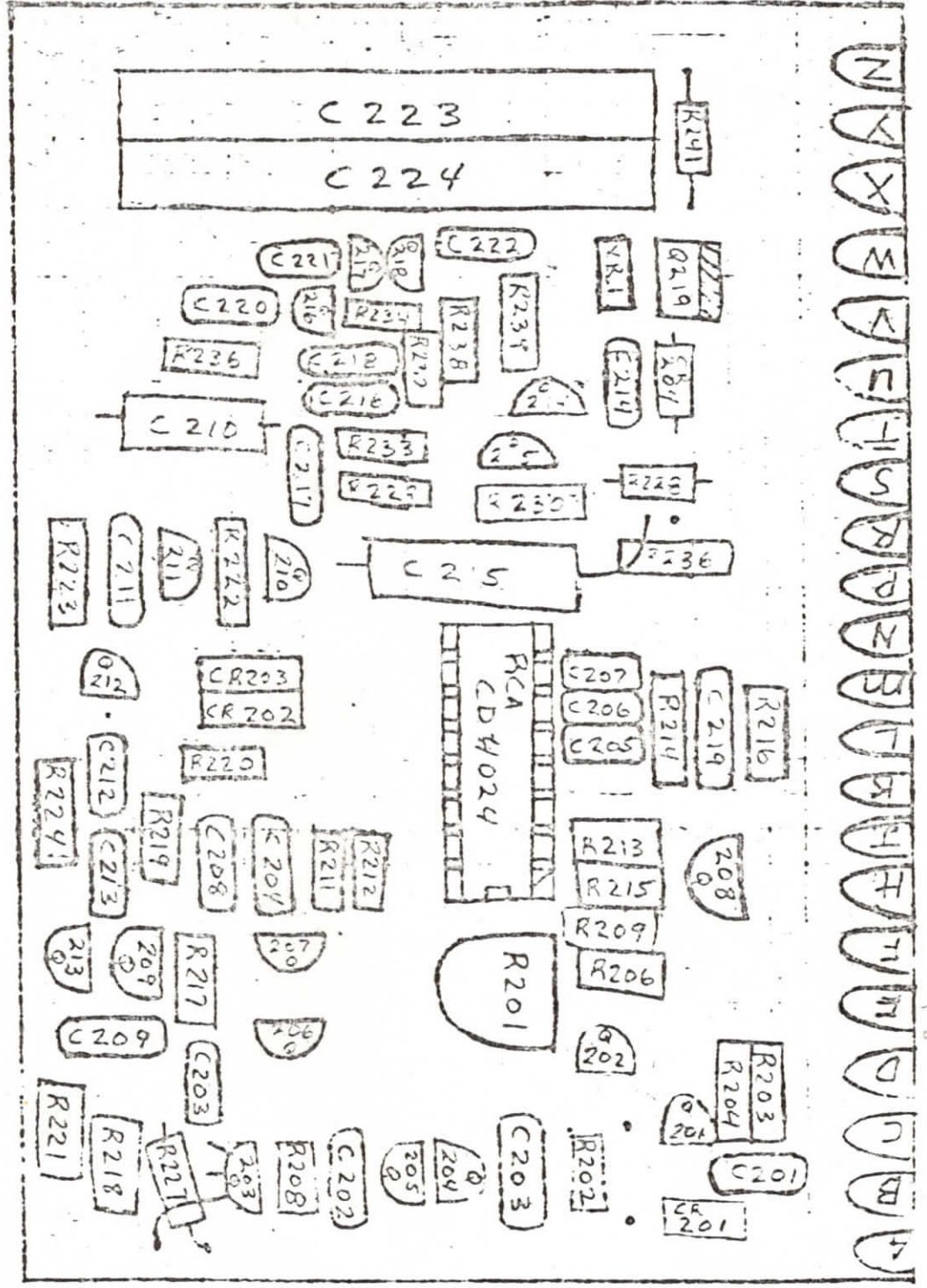
| | | |
|---------------|--------------|----------------|
| SCALE: FULL | APPROVED BY: | DRAWN BY: GIER |
| DATE: 1/19/72 | | REVIEWED: |

DECK PANEL - LEFT LOWER

| | |
|------------------|-------------------------|
| MODELS 103 & 104 | DRAWING NUMBER: 1010107 |
|------------------|-------------------------|

* NOTE: HOLE PATTERN OF
 B HOLES MUST MATCH
 WITH PART NO. A10103

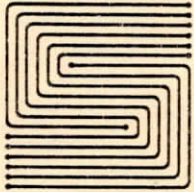
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D
C
B
A



Card # 310164

811D-103-104

2/3/76
Randy



STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

ENGINEERING COMMUNIQUE #3

JULY 21, 1980

RE: The discrepancy in high frequency record calibration
when using high output tapes.

The purpose of this communique is to discuss the problem of playing back 10 kHz at zero level at 15 ips when the recorder is aligned to the NAB standard.

The original 15 ips standard included compensation for high frequency bias loss (erasure). Through the years, the NAB standard tapes have been re-calibrated to compensate for drift made in the original calibrations. Due to the improved efficiency of the top end of the latest high output tapes (Ampex 456 for example), the playback response may be +1 dB or more at 10 kHz even with no record equalization on Stephens recorder/reproducers. This is due to our superior high frequency record response.

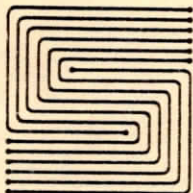
It has come to our attention that we are not the only ones having this problem. The NAB standard for 15 ips is again in need of re-calibration. An AES Committee recognizes this and the new standard tapes may closely match the European CCIR curve.

SEI suggests in the meanwhile calibrating the playback equalization at 10 kHz to be -2 dB when referenced to 1 kHz when playing back a standard alignment tape. The alternative is to insert a high frequency roll-off network in the record electronics for compensation. This would introduce additional phase shift and a reduction in the high frequency signal-to-noise ratio.

If you have any questions please call us. We would also appreciate your response to our solution.

STEPHENS ELECTRONICS, INC.

Doug Cioce
Director of Operations



STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

ENGINEERING COMMUNIQUE #3

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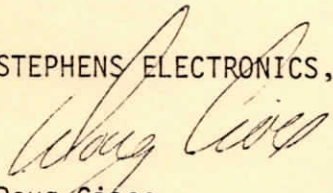
The original 15 ips standard included compensation for high frequency bias loss (erasure). Through the years, the NAB standard tapes have been re-calibrated to compensate for drift made in the original calibrations. Due to the improved efficiency of the top end of the latest high output tapes (Ampex 456 for example), the playback response may be +1 dB or more at 10 kHz even with no record equalization on Stephens recorder/reproducers. This is due to our superior high frequency record response.

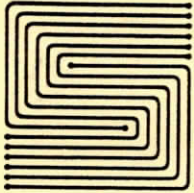
It has come to our attention that we are not the only ones having this problem. The NAB standard for 15 ips is again in need of re-calibration. An AES Committee recognizes this and the new standard tapes may closely match the European CCIR curve.

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If you have any questions please call us. We would also appreciate your response to our solution.

STEPHENS ELECTRONICS, INC.


Doug Cioce
Director of Operations



STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

ENGINEERING COMMUNIQUE #4

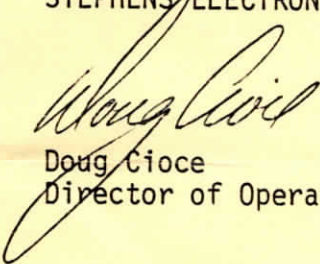
AUGUST 28, 1980

RE: Cleaning/Polishing Solutions

It has been brought to our attention that Bell Labs has issued a report on cleaning/polishing solutions containing silicone and their detrimental effect on electrical contacts. Their findings indicate that the silicone used in these solutions has a corrosive effect on electrical contacts causing erosion and pitting, therefore leading to an intermittent connection.

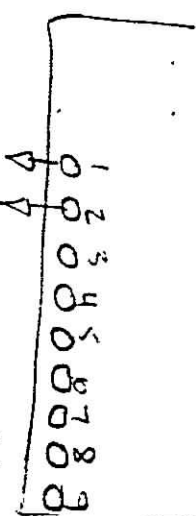
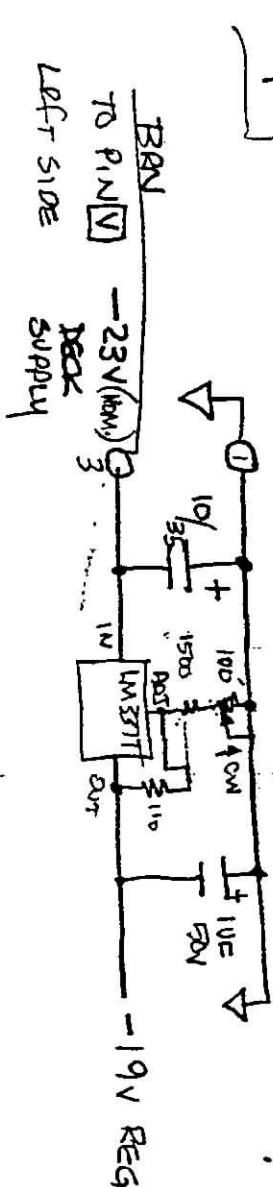
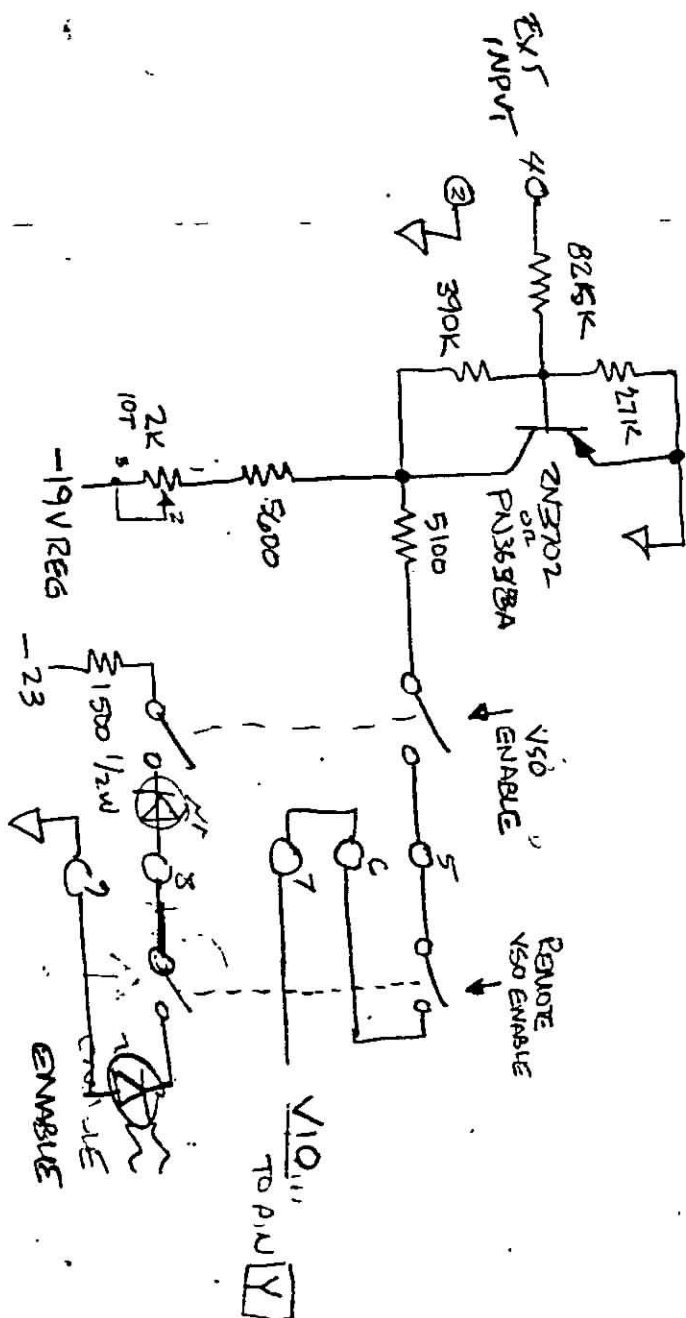
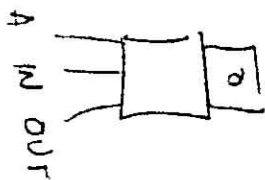
We therefore recommend that no cleaning/polishing solutions containing silicone be used in the cleaning of Stephens Recorders/Reproducers.

STEPHENS ELECTRONICS, INC.

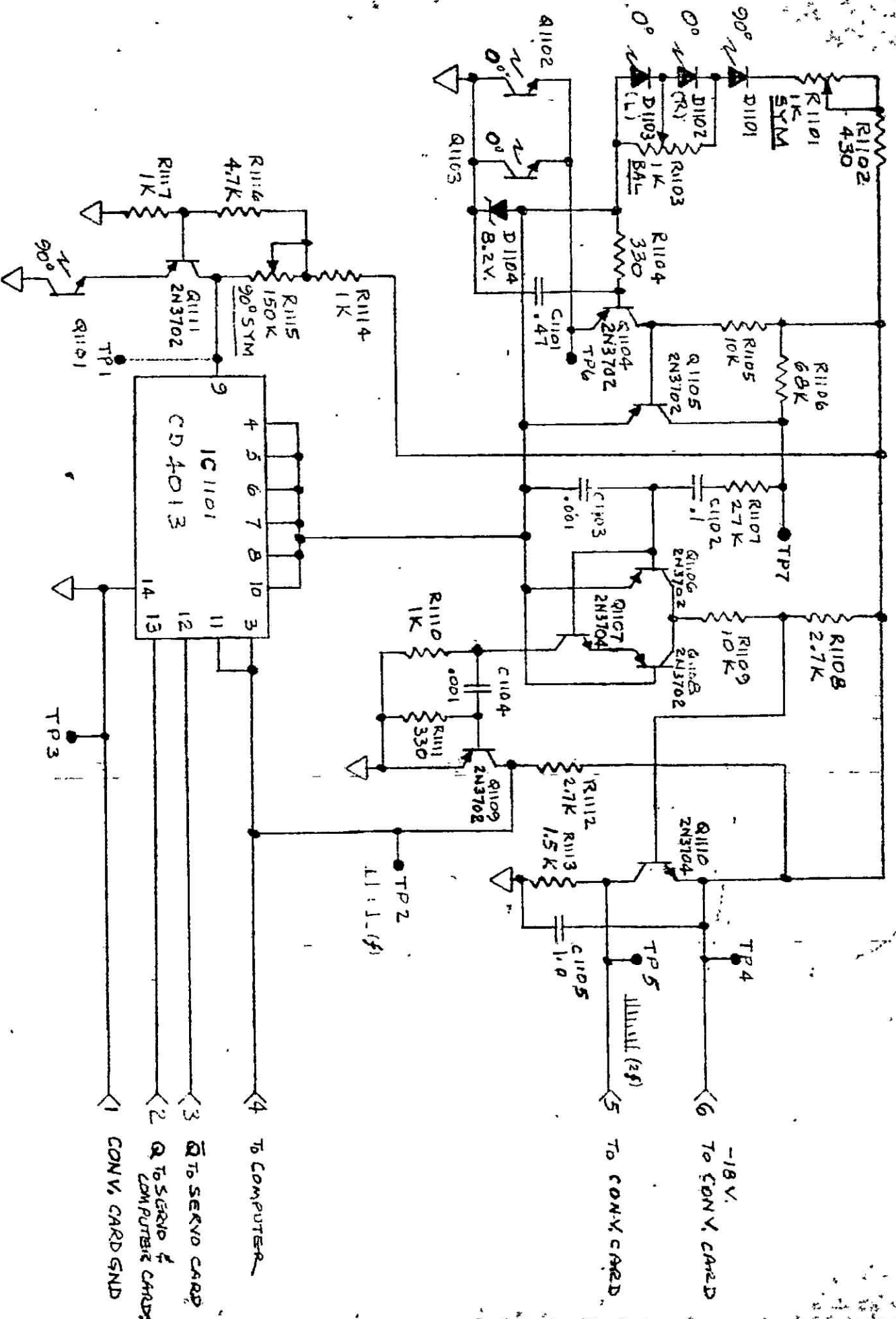


Doug Cioce
Director of Operations

$$\begin{aligned} +.524 &= -16.57 \\ -1.42 &= -12.75 \\ -1.365 &= -9.53 \end{aligned}$$



STEPHEN INTERACE



SCHEMATIC, SENSOR INTERFACE CARD AND SENSORS

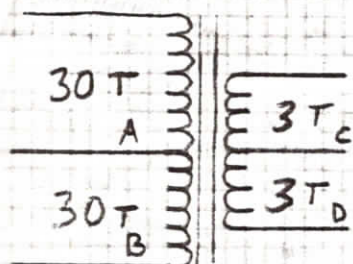
FIGURE 6-10

3C-1101

6/18/79 PB
 ADDED FIG# 7/30/79 AS

9/12/74 RANDY

BIAS CHASSIS COILS O.S.C. TRANS.

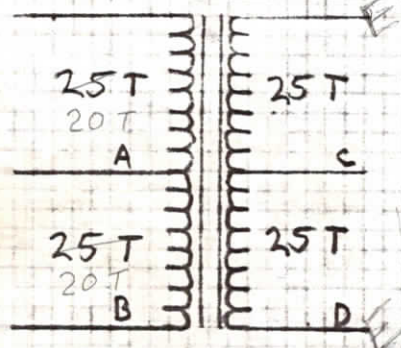


30 TURNS OF #24 SOLID ENAMEL COATED
WIRE BELDON #8052

3 TURNS OF #26 SOLID ENAMEL COATED
WIRE BELDON #~~8052~~ 8065

WIND 2 WIRES AT A TIME, THE
30 #24'S 1ST, THEN THE #26'S
BOBIN # 2616 PCB1 SEPERATED BY TAPE
CORE # 2616P A100-3D3

STANDARD OUTPUT - ERASE



25 TURNS OF #24 SOLID ENAMEL COATED
WIRE BELDON #8052

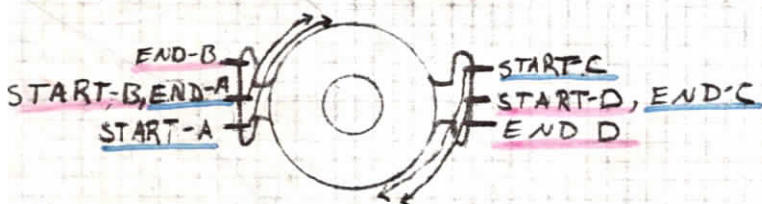
WIND 4 WIRES AT ONE TIME

CUT THE 4 WIRES TO A LENGTH OF
56 INCHES BEFORE TURNING.

BOBIN # 2616 PCB1

CORE # 2616 PL100 3B7

CORES AND BOBINS FROM FERROXCLUBE CORP.



WRAP COILS WITH TAPE
WHEN FINISHED AND
CHECK FOR GOOD FIT
IN CORES.

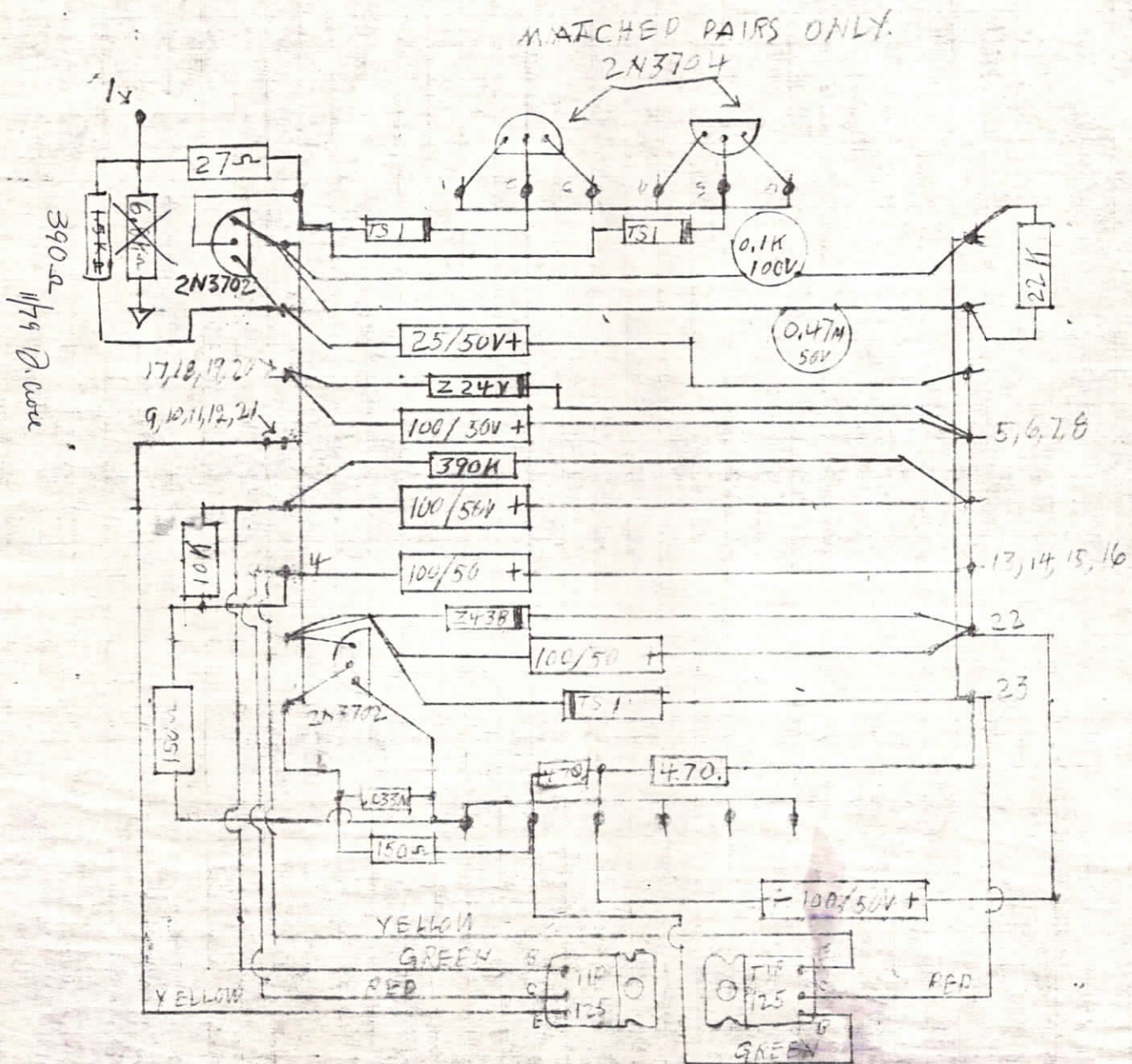
WIND
CLOCKWISE

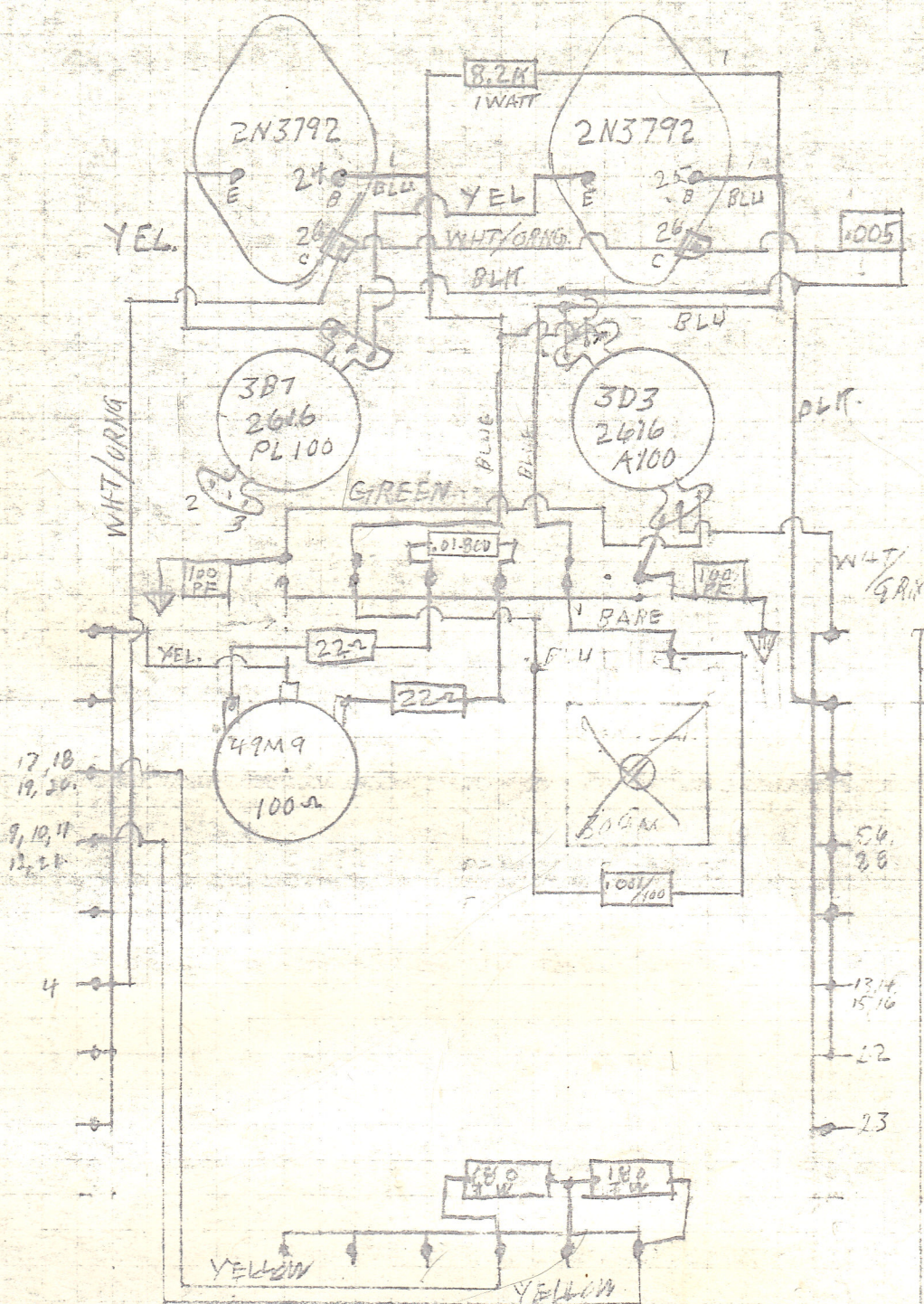
22 25
22 25

23 25
23 25

811D BIAS SUPPLY

PAGE 2



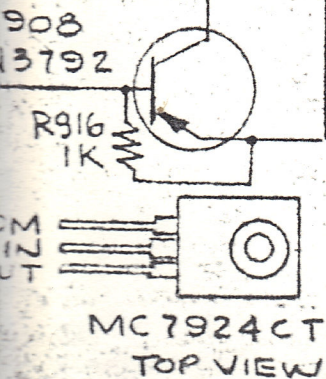
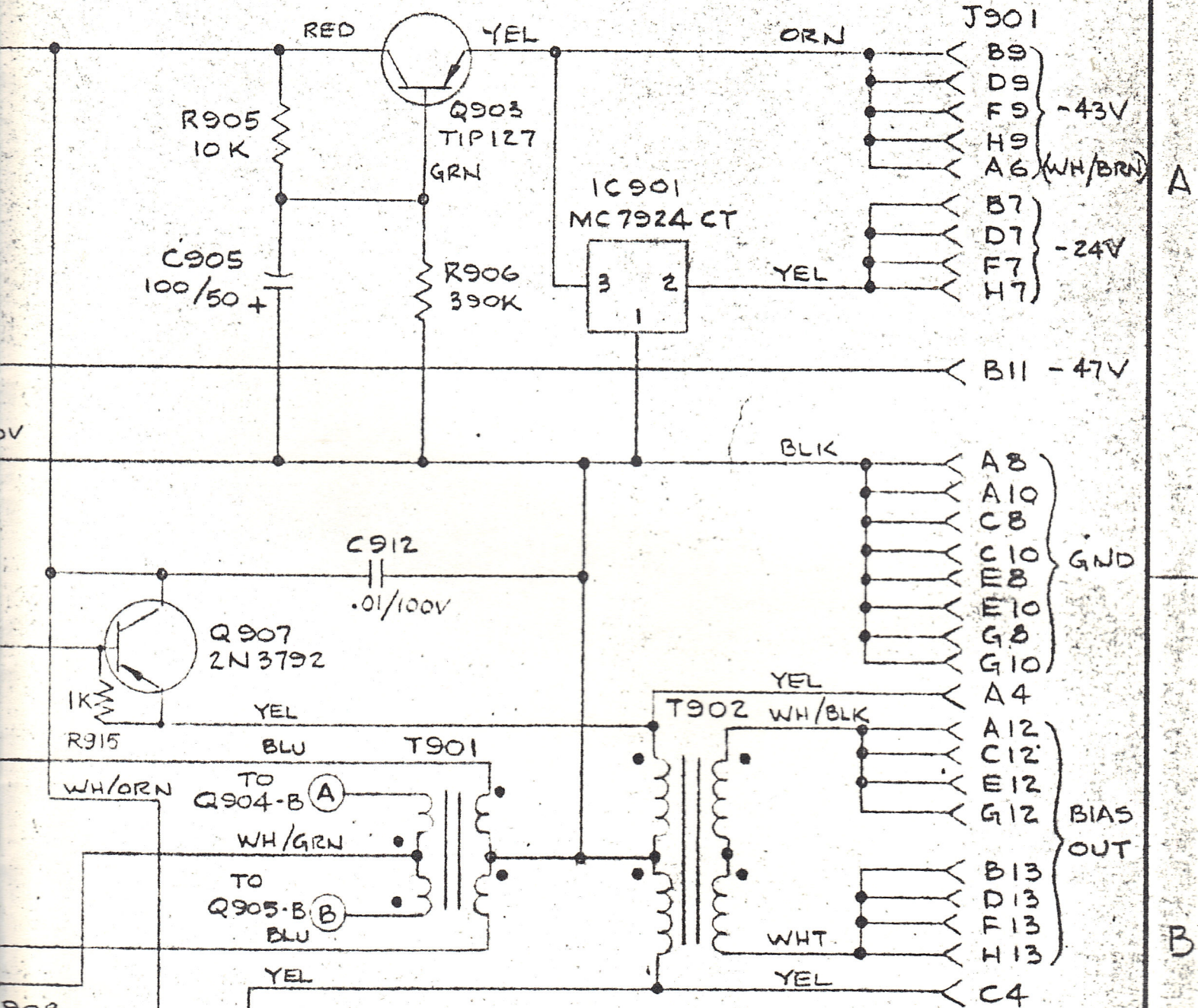
BIAS CONNECTOR
WIRE CODE

1. VIOLET - H 11.
2. WHITE - BDFH - 13
3. WHT/BLK - ACEG - 12
4. BLUE - B - 11K.
5. BLACK - A - 10
6. BLACK - C - 10
7. BLACK - E - 10
8. BLACK - G - 10
9. ORANG - B - 9
10. ORANG - D - 9
11. ORANG - F - 9
12. ORANG - H - 9
13. BLACK - A - 8
14. BLACK - C - 8
15. BLACK - E - 8
16. BLACK - G - 8
17. YELLOW - B - 7
18. YELLOW - D - 7
19. YELLOW - F - 7
20. YELLOW - H - 7
21. WHT/ORNG - A - 6
22. RED - B - 1
23. BROWN - D - 1
24. WHITE - A - 1
25. WHITE - C - 1

NOT USED IN SLAVE

REVISIONS

| LTR | DESCRIPTION | DATE | BY |
|-----|---|---------|----------|
| A | WAS DWG. NO. 110902-C MODEL WAS 821B, REMOVE R913, R914 R911 WAS 1.5K C909 WAS 25/50V | 1-23-81 | B. CLARK |



STEPHENS ELECTRONICS, INC.

SCALE: ~

APPROVED BY:

DRAWN BY GEIER

DATE: 8 OCT 79

REVISED F-21-81

BIAS OSCILLATOR MODULE

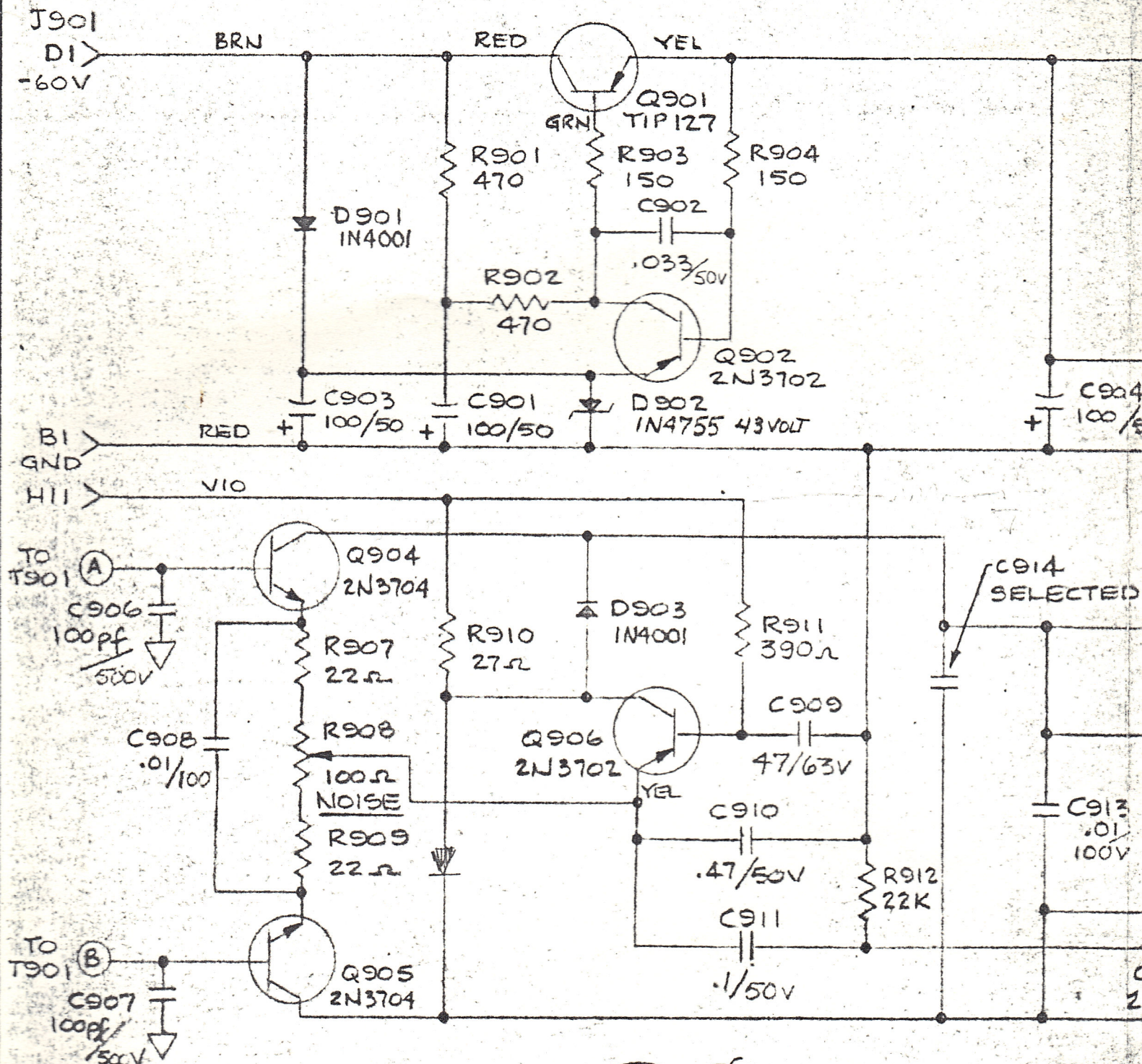
MODEL 811D

FIGURE 6-7

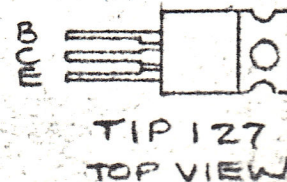
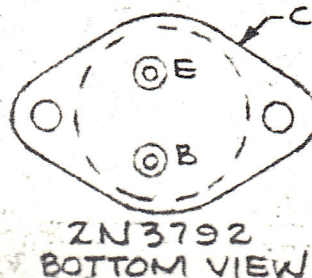
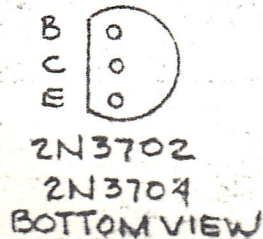
DRAWING NUMBER

SC-0901A

ALL RESISTORS 1/4 WATT
ALL CAPACITORS IN MICROFARADS
(UNLESS OTHERWISE NOTED)

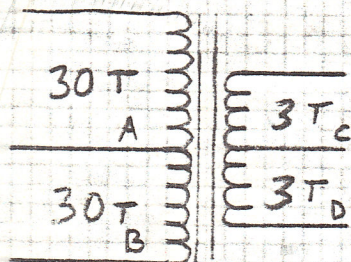


| LAST SYM NO. USED | NOS. OMITTED |
|----------------------|-----------------|
| C 914 | |
| D 903 | |
| Q 908 | |
| R 916 | R913, R914 |



9/12/74 RANDY

BIAS CHASSIS COILS O.S.C. TRANS

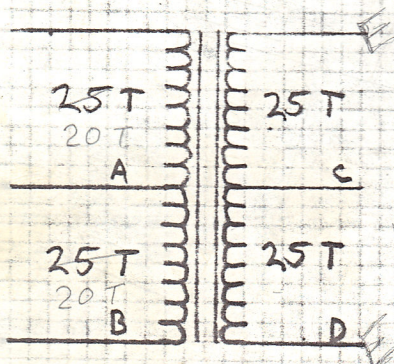


30 TURNS OF #24 SOLID ENAMEL COATED
WIRE BELDON #8052

3 TURNS OF #26 SOLID ENAMEL COATED
WIRE BELDON #~~8052~~ 8065

WIND 2 WIRES AT A TIME, THE
30 #24'S 1ST, THEN THE #26'S
BOBIN # 2616 PCB1 SEPERATED BY TAPE
CORE # 2616P A100-3D3

STANDARD OUTPUT - ERASE



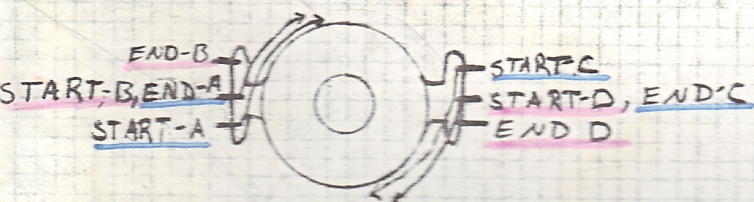
25 TURNS OF #24 SOLID ENAMEL COATED
WIRE BELDON #8052

WIND 4 WIRES AT ONE TIME

CUT THE 4 WIRES TO A LENGTH OF
56 INCHES BEFORE TURNING.

BOBIN # 2616 PCB1
CORE # 2616 PL100 3B7

CORES AND BOBINS FROM FERROXCUBE CORP.



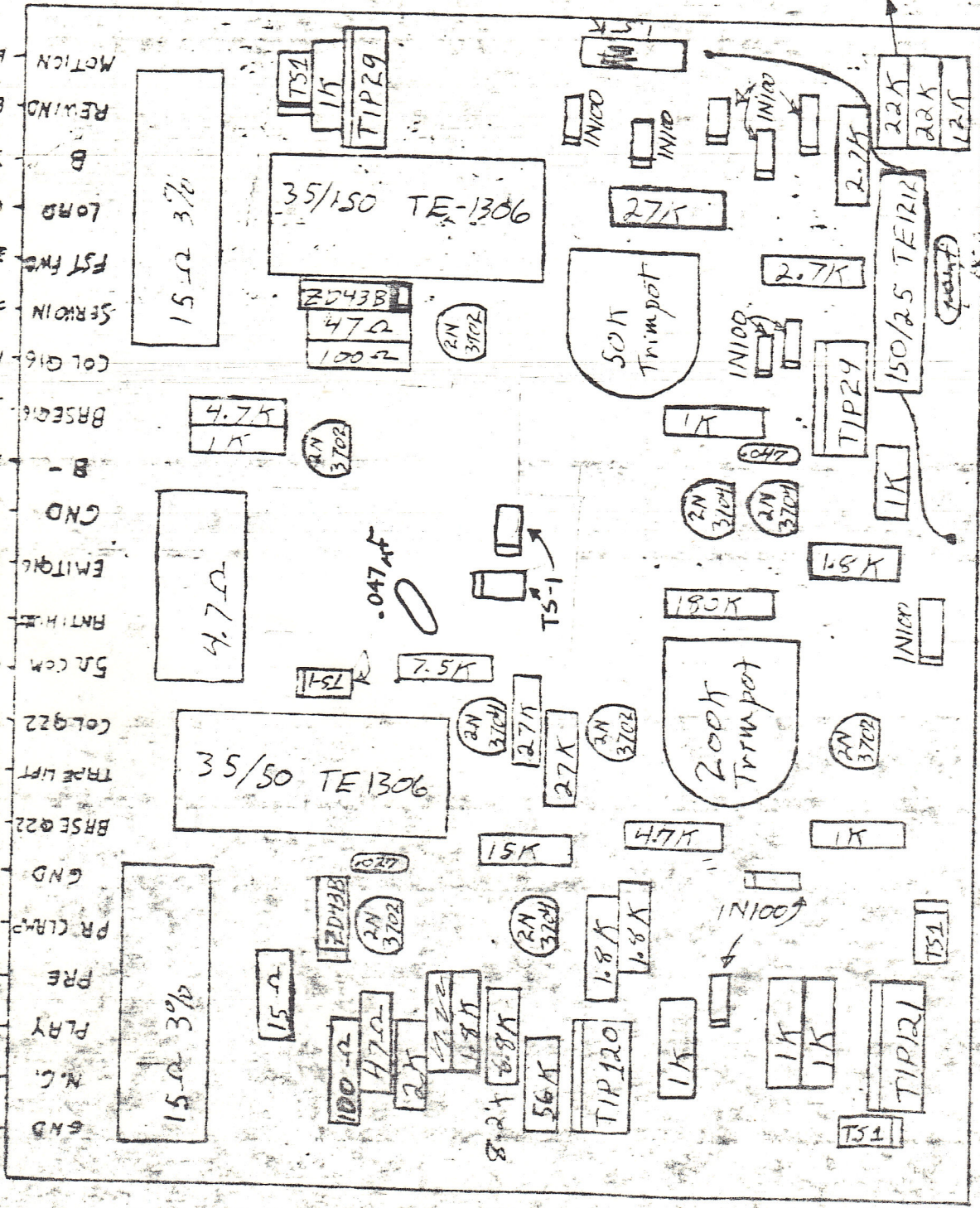
WRAP COILS WITH TAPE
WHEN FINISHED AND
CHECK FOR GOOD FIT
IN CORES.

WIND
CLOCKWISE

22 25
22 25

23 25
23 25

master copy



| | | | |
|----------------------------|----------------|----------------|--|
| STEPHENS ELECTRONICS, INC. | | DRAWN BY PKW | |
| APPROVED BY: | | REVISED | |
| SCALE: 2:1 | DATE: 10/10/74 | | |
| | | DRAWING NUMBER | |

BCAL. 2.1

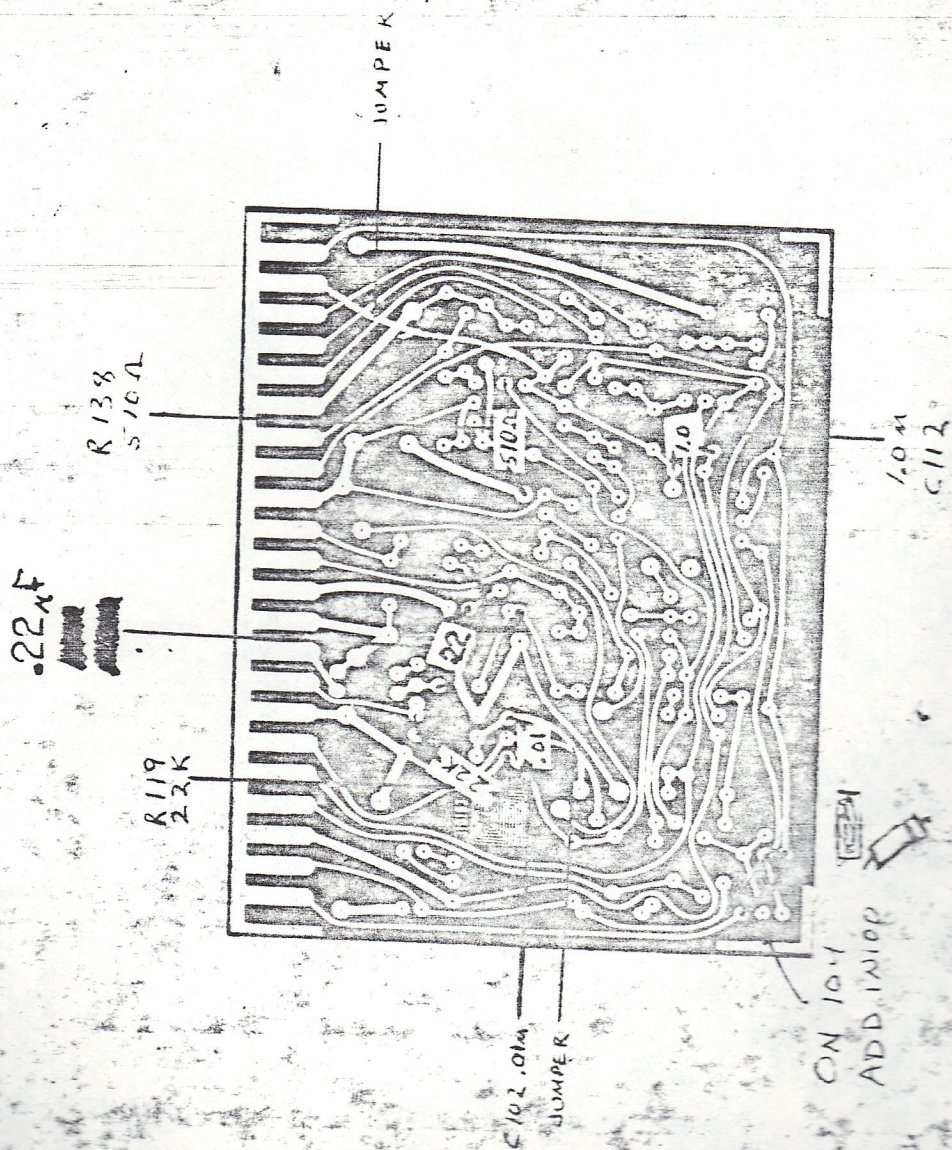
DATE: 10/10/74

AD NAWHO

016187

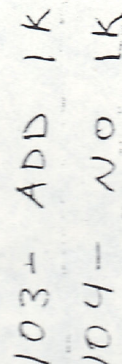
THE UNIVERSITY OF CHICAGO

811D-103



811D-103

2/3/76



103 + ADD 1K

104-201K

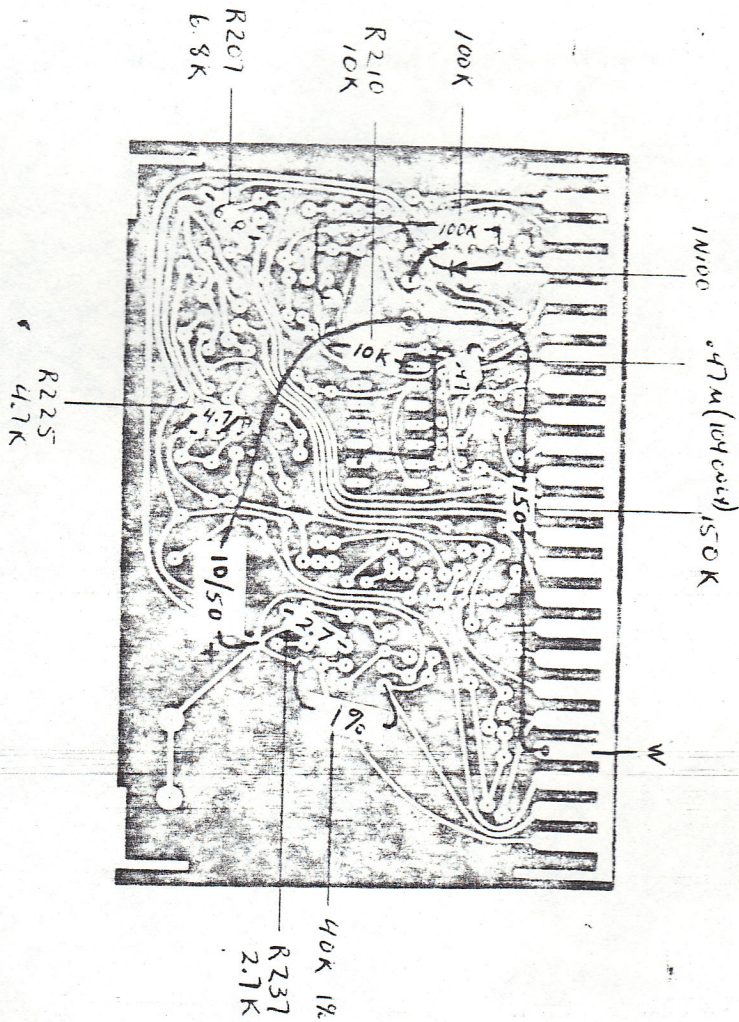
A
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Z

7

310164

103-104

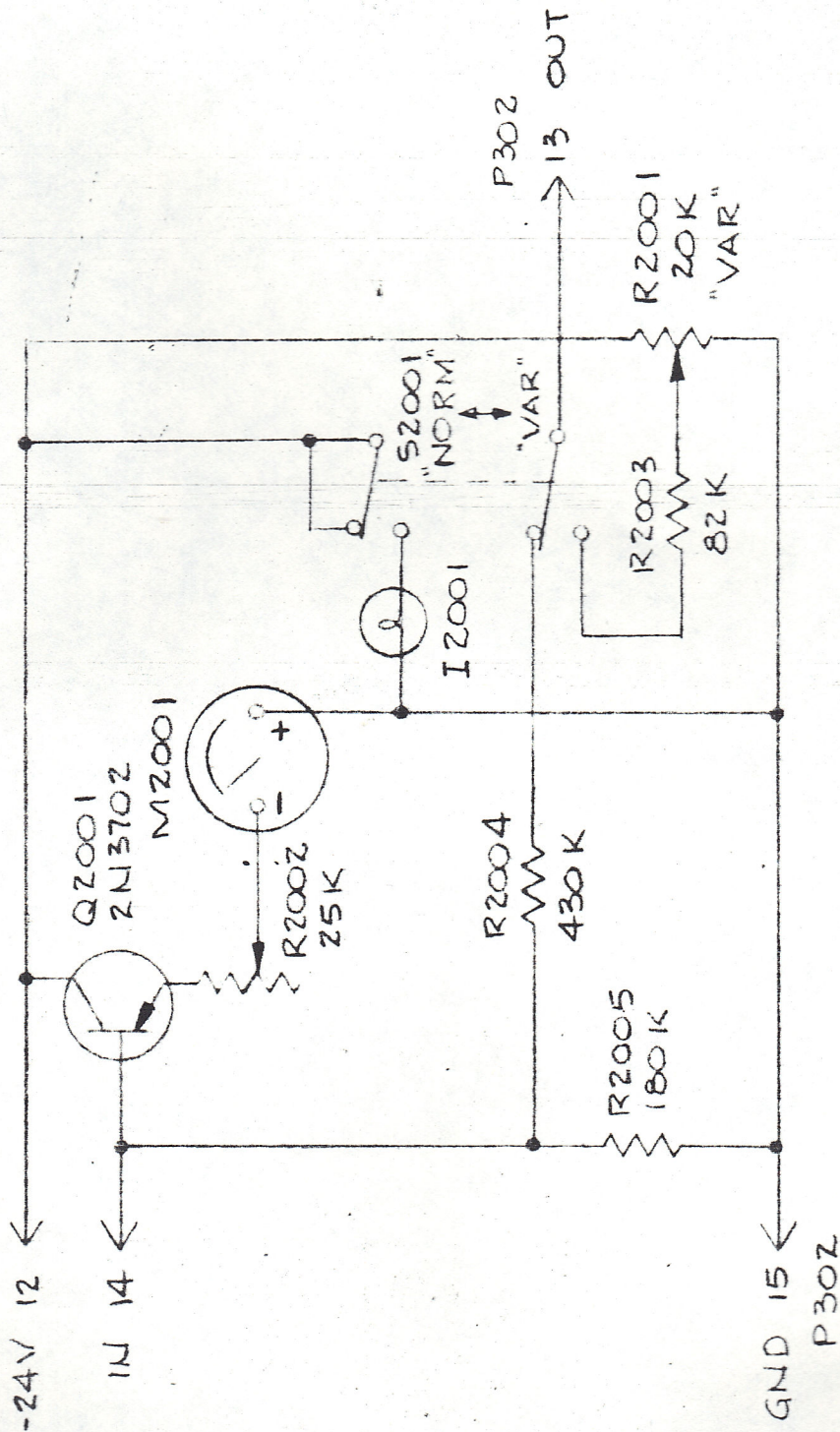
5/17/76



103- NO .47u CAP
104- ADD .47u CAP

REVISIONS

LTR DESCRIPTION DATE BY



STEPHENS ELECTRONICS, INC.

| | | |
|-----------------|---------------------------------|-----------------|
| SCALE: \sim | APPROVED BY: <i>[Signature]</i> | DRAWN BY: GFE12 |
| DATE: 24 SEP 79 | | REVISED |

VSO MODULE

| | | |
|-------------|-------------|---------------------------|
| MODEL 821-B | FIGURE 6-17 | DRAWING NUMBER SC-2001 |
|-------------|-------------|---------------------------|

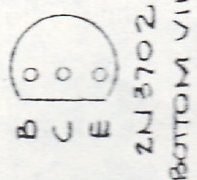
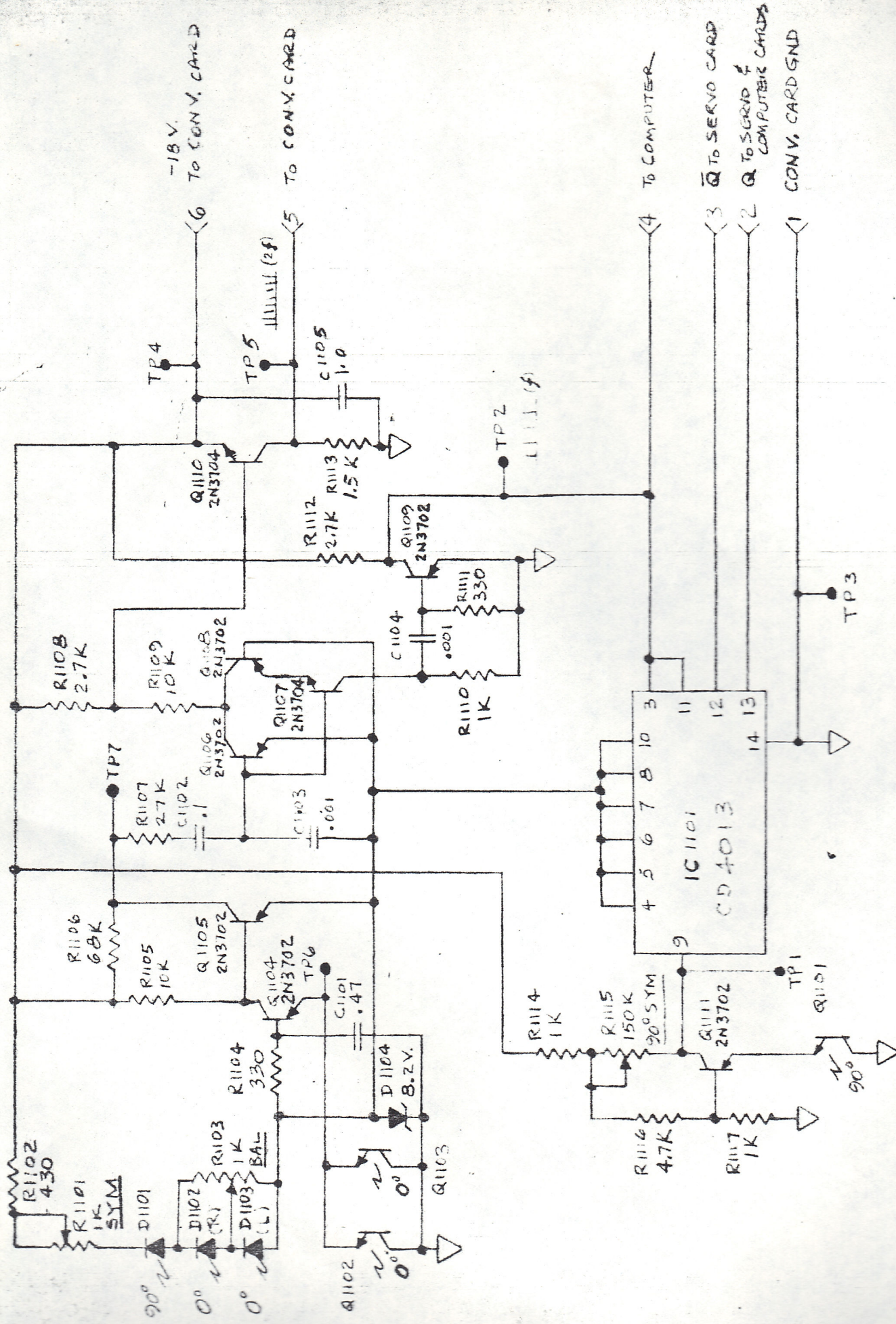


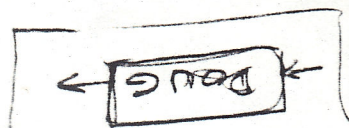
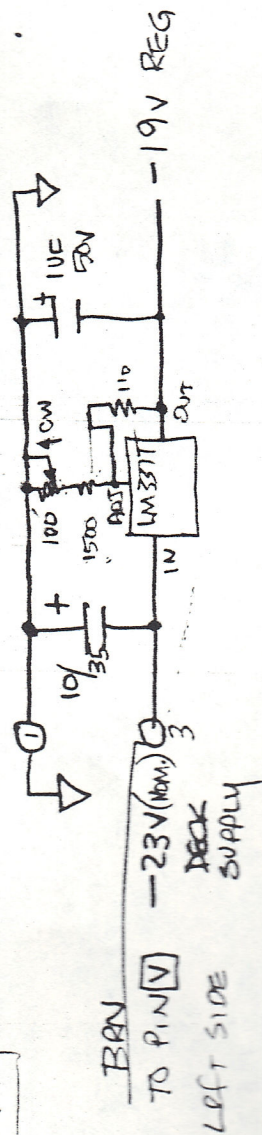
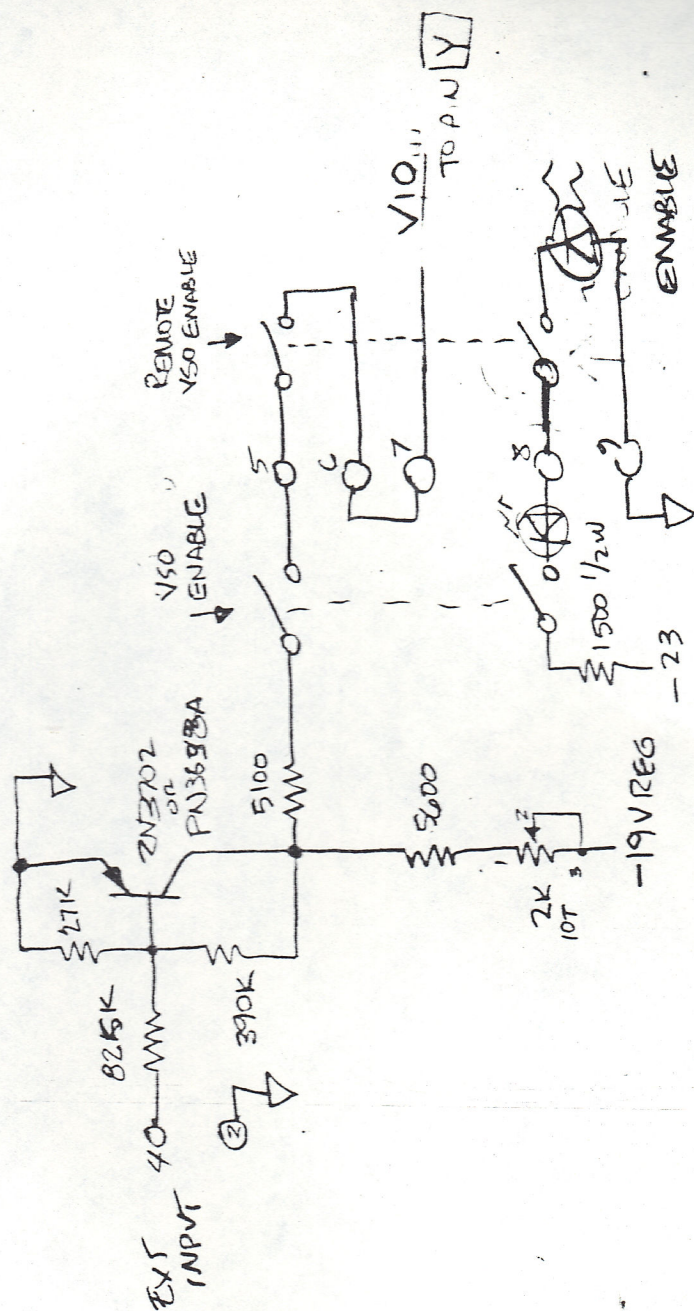
FIGURE 6-17



SC-1101

FIGURE 6-10

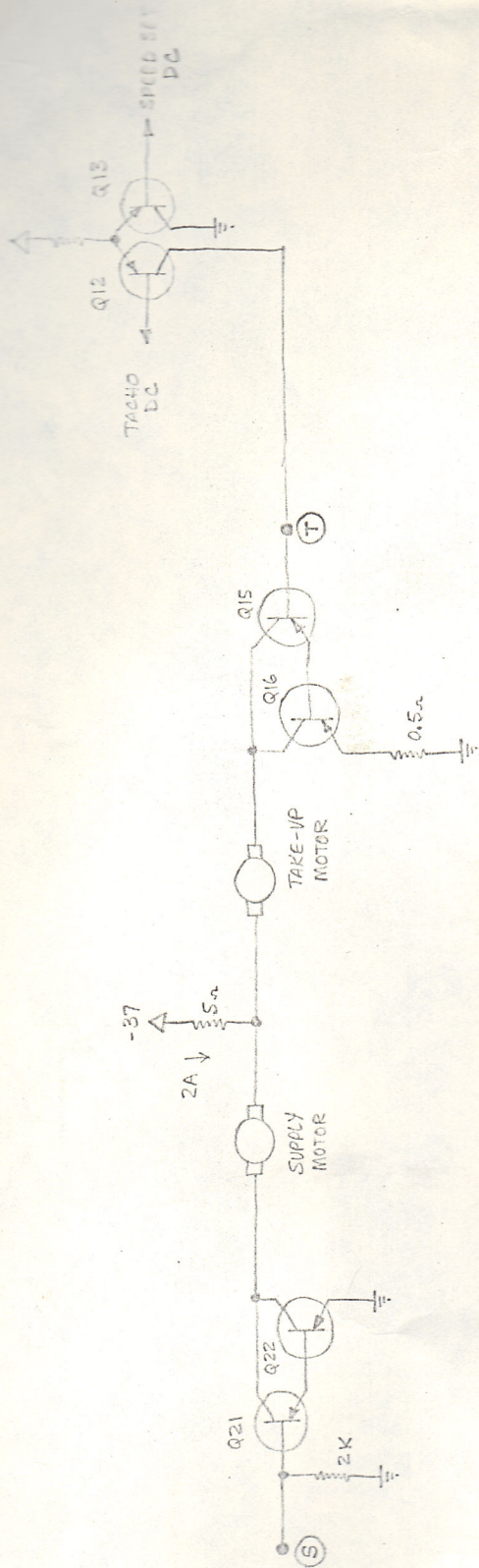
$+1.524 = -16.07$
 $-1.42 = -12.75$
 $-1.365 = -9.53$



1 2 3 4 5 6 7 8 9
 0 0 0 0 0 0 0 0 0

INTERFAC

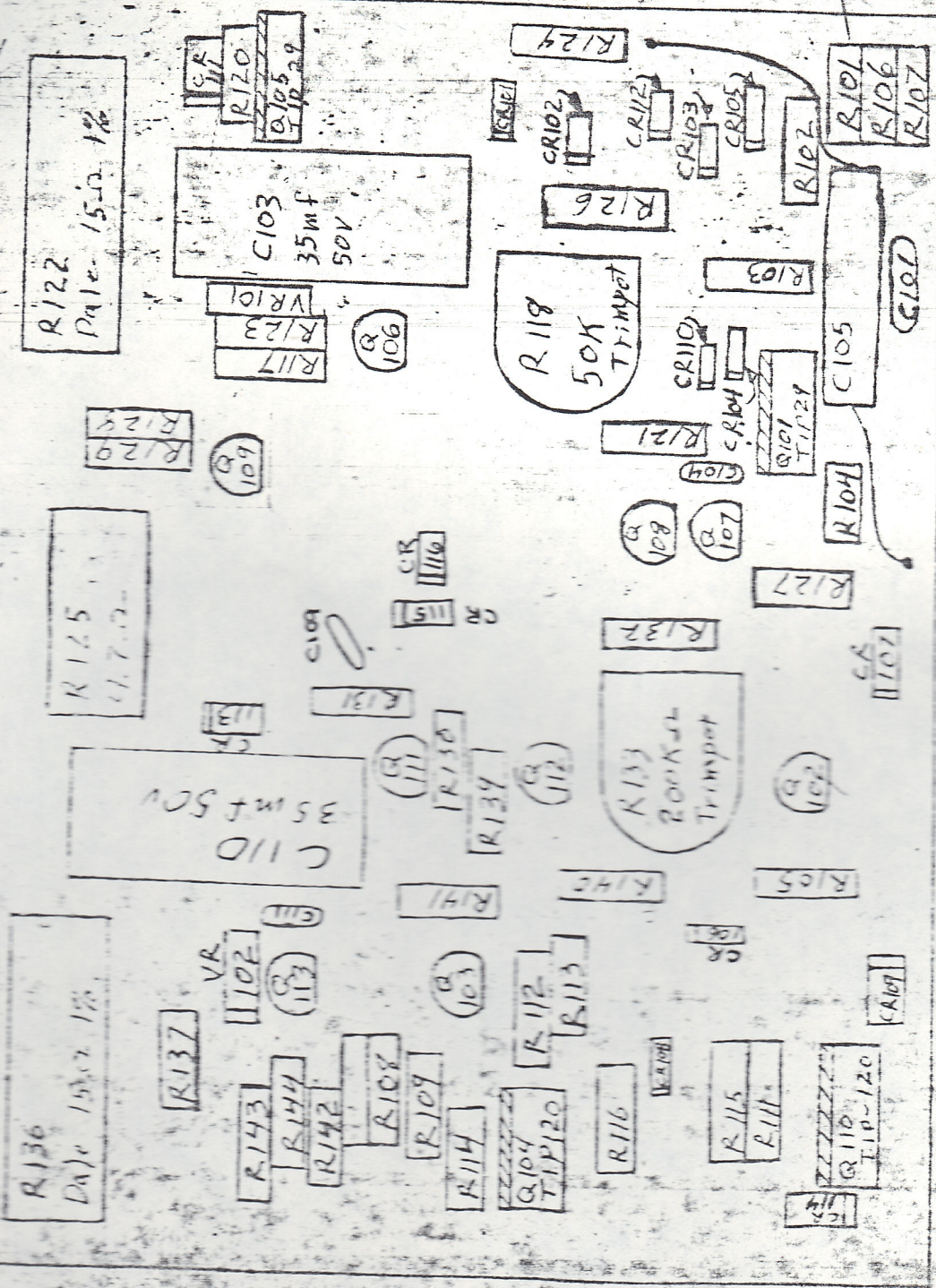
-37



SIMPLIFIED SERVO

Servo Card
 data amplifying
 modification
 April 6, 1977

END
 N.C.
 PLY
 PRE
 PS CAR
 GND
 ESE
 TRAIL
 COL 42
 S.A.C.
 ENTING
 EMIT
 GND
 B -
 BRSE
 COL 41
 SERWIN
 FST FW
 LORD
 B
 REV/KC
 ACTION



STEPHENS ELECTRONICS, INC.

| | | |
|---------------------|--------------|--------------|
| SCALE 2:1 | APPROVED BY: | DRAWN BY PKW |
| DATE 10/10/74 | | REVISED |
| Servo Card # 310163 | | |
| DRAWING NUMBER | | 310163 |

Top View

